



DR. KEVIN KNUTH

DISCUSSES NOMADIC ETS, HIS
RECENT TALK TO THE MAX PLANCK
INSTITUTE AND THE CURRENT UFO
SITUATION



UFONN
SUNDAY

1
00:01:13,179 --> 00:00:26,580

[Music]

2
00:01:15,520 --> 00:01:13,189
and good evening from Philadelphia Frank

3
00:01:17,410 --> 00:01:15,530
here with a late-night edition of UFO

4
00:01:19,450 --> 00:01:17,420
news network Sunday we got in just under

5
00:01:21,490 --> 00:01:19,460
the wire two minutes before midnight

6
00:01:23,109 --> 00:01:21,500
tonight but we're all ready to go we've

7
00:01:25,120 --> 00:01:23,119
got a great decimal guest with us

8
00:01:28,120 --> 00:01:25,130
tonight making his second appearance and

9
00:01:30,190 --> 00:01:28,130
he has had a very interesting year so

10
00:01:32,919 --> 00:01:30,200
let me get to my co-host and bring her

11
00:01:35,559 --> 00:01:32,929
on a chant Hannah a chant has everything

12
00:01:37,389 --> 00:01:35,569
going tonight and wants to bring on our

13
00:01:39,479 --> 00:01:37,399

special guests it's going really well

14

00:01:42,279 --> 00:01:39,489

thank you we have a wonderful guest

15

00:01:44,800 --> 00:01:42,289

tonight his name is Professor Kevin

16

00:01:46,569 --> 00:01:44,810

Knuth he's an associate professor in the

17

00:01:49,209 --> 00:01:46,579

Department of Physics at the University

18

00:01:53,499 --> 00:01:49,219

of Albany and as the editor in chief of

19

00:01:55,929 --> 00:01:53,509

the journal entropy mdpi he is a former

20

00:01:58,029 --> 00:01:55,939

NASA research scientist having worked

21

00:01:59,949 --> 00:01:58,039

for four years at NASA Ames Research

22

00:02:02,380 --> 00:01:59,959

Center in the intelligent systems

23

00:02:04,300 --> 00:02:02,390

division designing artificial

24

00:02:07,419 --> 00:02:04,310

intelligence algorithms for

25

00:02:09,779 --> 00:02:07,429

Astrophysical data analysis he has over

26

00:02:13,660 --> 00:02:09,789

20 years of experience in applying

27

00:02:15,759 --> 00:02:13,670

Bayesian and maximum entropy entropy

28

00:02:17,830 --> 00:02:15,769

methods to the design of the machine

29

00:02:21,250 --> 00:02:17,840

learning algorithms for data analysis

30

00:02:22,659 --> 00:02:21,260

applied to physical sciences his current

31

00:02:24,250 --> 00:02:22,669

research interests include the

32

00:02:26,460 --> 00:02:24,260

foundation of physics quantum

33

00:02:28,750 --> 00:02:26,470

information inferencing inquiry

34

00:02:30,879 --> 00:02:28,760

autonomous robotics and the search for

35

00:02:32,890 --> 00:02:30,889

and characterization of extrasolar

36

00:02:35,229 --> 00:02:32,900

planets he has published over 90

37

00:02:37,680 --> 00:02:35,239

peer-reviewed publications and has been

38

00:02:40,900 --> 00:02:37,690

invited to give over 80 presentation in

39

00:02:42,129 --> 00:02:40,910

14 different countries thank you for

40

00:02:46,900 --> 00:02:42,139

being on the show with us tonight

41

00:02:49,110 --> 00:02:46,910

Kevin you'll need to correct me on

42

00:02:52,330 --> 00:02:49,120

something here I had a little trouble

43

00:02:54,789 --> 00:02:52,340

saying a word I think you heard me when

44

00:03:04,990 --> 00:02:54,799

I tried I struggled a little bit with in

45

00:03:08,050 --> 00:03:05,000

applying BA y es I am what is that it

46

00:03:09,490 --> 00:03:08,060

comes from Bayes theorem from Thomas

47

00:03:12,309 --> 00:03:09,500

Bayes and so it's a theorem in

48

00:03:14,680 --> 00:03:12,319

probability theory fantastic thank you

49

00:03:18,340 --> 00:03:14,690

for clearing that up and I understand

50

00:03:20,379 --> 00:03:18,350

that you've been involved in science of

51
00:03:20,949 --> 00:03:20,389
probably for most of your life can you

52
00:03:23,770 --> 00:03:20,959
please tell

53
00:03:26,289 --> 00:03:23,780
why did you decide to go ahead and brace

54
00:03:28,300 --> 00:03:26,299
the world of science what was the

55
00:03:34,270 --> 00:03:28,310
impetus for you to have the desire to

56
00:03:36,729 --> 00:03:34,280
get involved in this topic came from my

57
00:03:39,240 --> 00:03:36,739
parents my parents both nurtured my

58
00:03:42,789 --> 00:03:39,250
interests in science my father

59
00:03:44,890 --> 00:03:42,799
especially introduced me to the theory

60
00:03:47,500 --> 00:03:44,900
of relativity when I was rather young

61
00:03:50,440 --> 00:03:47,510
maybe fifth grade or so and he had given

62
00:03:53,140 --> 00:03:50,450
me a popular book written by Einstein

63
00:03:55,690 --> 00:03:53,150

damn to read and I just devoured that

64

00:03:59,559 --> 00:03:55,700

book and really was very interested in

65

00:04:03,069 --> 00:03:59,569

that so that's that's came from I also

66

00:04:05,920 --> 00:04:03,079

was born at the right time I was born in

67

00:04:09,819 --> 00:04:05,930

1965 so I barely remember the moon

68

00:04:12,159 --> 00:04:09,829

landings in I was four years old and and

69

00:04:14,050 --> 00:04:12,169

I remember being at my grandparents

70

00:04:15,970 --> 00:04:14,060

house watching it on television and and

71

00:04:19,860 --> 00:04:15,980

everyone telling me this is so important

72

00:04:23,770 --> 00:04:19,870

this is the most important and it really

73

00:04:25,899 --> 00:04:23,780

and so I think you know there's there's

74

00:04:28,390 --> 00:04:25,909

several factors that that went into that

75

00:04:29,680 --> 00:04:28,400

but that was an important year and I

76
00:04:32,950 --> 00:04:29,690
also wanna I'm glad you brought that up

77
00:04:35,500 --> 00:04:32,960
because up you know that period time

78
00:04:38,170 --> 00:04:35,510
really allowed a lot of kids to look up

79
00:04:40,149 --> 00:04:38,180
to certain people the folks that were

80
00:04:42,370 --> 00:04:40,159
involved in that huge project a lot of

81
00:04:45,490 --> 00:04:42,380
them became heroes for the general

82
00:04:47,320 --> 00:04:45,500
public to look up to did you have any

83
00:04:51,040 --> 00:04:47,330
role models or anybody during that

84
00:04:53,529 --> 00:04:51,050
period of time that you felt were role

85
00:04:55,300 --> 00:04:53,539
models to you and also in addition to

86
00:05:01,240 --> 00:04:55,310
that did you find yourself looking up in

87
00:05:06,129 --> 00:05:01,250
the sky more role models that was that

88
00:05:08,170 --> 00:05:06,139

was really an enormous event and and

89

00:05:09,820 --> 00:05:08,180

also Albert Einstein I think those you

90

00:05:12,159 --> 00:05:09,830

know reading about relativity and I

91

00:05:15,670 --> 00:05:12,169

found it just fascinating but and I

92

00:05:19,570 --> 00:05:15,680

really one of the really strong memories

93

00:05:22,330 --> 00:05:19,580

of the moon landings was we were heading

94

00:05:24,730 --> 00:05:22,340

home after watching in on television and

95

00:05:26,409 --> 00:05:24,740

it was late in the evening and my father

96

00:05:28,240 --> 00:05:26,419

was carrying me I was only four years

97

00:05:29,920 --> 00:05:28,250

old and I remember we paused outside

98

00:05:31,149 --> 00:05:29,930

before getting in the car and he pointed

99

00:05:35,570 --> 00:05:31,159

up at the moon and he said there are

100

00:05:40,830 --> 00:05:37,920

wow that's amazing there are three

101
00:05:42,779 --> 00:05:40,840
people up there and and it's something

102
00:05:44,820 --> 00:05:42,789
that you know kids today haven't ever

103
00:05:45,409 --> 00:05:44,830
experienced and I think that's it's a

104
00:05:47,430 --> 00:05:45,419
shame

105
00:05:50,520 --> 00:05:47,440
hopefully we'll experience again soon

106
00:05:51,930 --> 00:05:50,530
with an upcoming Artemis missions yes

107
00:05:55,710 --> 00:05:51,940
and I'm glad you brought up the Artemis

108
00:05:57,749 --> 00:05:55,720
missions what do you feel will come of

109
00:05:59,939 --> 00:05:57,759
those missions and what do you think is

110
00:06:04,290 --> 00:05:59,949
inspiring them to be engaged in such a

111
00:06:05,969 --> 00:06:04,300
serious mission that means a lot yeah

112
00:06:08,870 --> 00:06:05,979
tell us a little bit about the mission -

113
00:06:11,219 --> 00:06:08,880

yes please

114

00:06:14,520 --> 00:06:11,229

the mission is it's going to be a

115

00:06:16,980 --> 00:06:14,530

stepping stone to Mars and some way and

116

00:06:18,570 --> 00:06:16,990

the ideas that we're going to go to the

117

00:06:20,909 --> 00:06:18,580

moon and not leave we're basically going

118

00:06:22,520 --> 00:06:20,919

to set up start setting up a base there

119

00:06:29,189 --> 00:06:22,530

which i think is should have been done

120

00:06:30,749 --> 00:06:29,199

decades ago the the Artemis mission I

121

00:06:33,360 --> 00:06:30,759

was glad to see that they're going to

122

00:06:35,129 --> 00:06:33,370

have at least one one female astronaut I

123

00:06:36,869 --> 00:06:35,139

I don't know why there can't be three

124

00:06:39,390 --> 00:06:36,879

female astronauts on the mission I think

125

00:06:41,370 --> 00:06:39,400

that would be setting since her fitting

126

00:06:44,670 --> 00:06:41,380

since Artemis was the sister of Apollo

127

00:06:49,680 --> 00:06:44,680

so it would be that would be interesting

128

00:06:51,480 --> 00:06:49,690

as well so but I think that's hopefully

129

00:06:52,700 --> 00:06:51,490

we'll we'll follow through and it'll be

130

00:06:56,519 --> 00:06:52,710

a great mission

131

00:06:59,309 --> 00:06:56,529

thank you for answering that do you feel

132

00:07:03,180 --> 00:06:59,319

like we have any more missions that we

133

00:07:07,820 --> 00:07:03,190

can endeavour to pursue aside from this

134

00:07:12,149 --> 00:07:07,830

mission right now well there's the

135

00:07:13,920 --> 00:07:12,159

missions to Europa to study the surface

136

00:07:16,830 --> 00:07:13,930

of Europa and get some idea of what the

137

00:07:18,779 --> 00:07:16,840

subsurface oceans are like the missions

138

00:07:21,120 --> 00:07:18,789

to Titan I think are very important to

139

00:07:23,939 --> 00:07:21,130

get some idea of what the environment on

140

00:07:25,980 --> 00:07:23,949

tightness is is like and whether a good

141

00:07:27,629 --> 00:07:25,990

harbor life could be very different life

142

00:07:30,390 --> 00:07:27,639

than what we were expecting earth but

143

00:07:32,100 --> 00:07:30,400

that would be very interesting yeah god

144

00:07:35,100 --> 00:07:32,110

I'm glad I'm glad you mentioned that

145

00:07:36,930 --> 00:07:35,110

professor because if we find that there

146

00:07:40,230 --> 00:07:36,940

is some life even at the the lowest

147

00:07:42,749 --> 00:07:40,240

level bacterial life or even like a

148

00:07:46,019 --> 00:07:42,759

crinoid or who knows maybe even some

149

00:07:47,129 --> 00:07:46,029

sort of a vertebrate sea life on those

150

00:07:50,850 --> 00:07:47,139

planet are on those

151
00:07:57,239 --> 00:07:50,860
moons that orbit them while in Selenas

152
00:08:00,659 --> 00:07:57,249
orbits Saturn or Jupiter orbits it also

153
00:08:02,369 --> 00:08:00,669
has subsurface water as well so these

154
00:08:05,159 --> 00:08:02,379
are all very exciting places and

155
00:08:06,629 --> 00:08:05,169
interesting places so if we find life

156
00:08:08,610 --> 00:08:06,639
and that we know there's life here so

157
00:08:10,379 --> 00:08:08,620
there's life on two bodies in the solar

158
00:08:14,369 --> 00:08:10,389
system that I mean that that pretty well

159
00:08:18,740 --> 00:08:14,379
bodes for life being pretty common out

160
00:08:22,439 --> 00:08:18,750
there I would think yeah I think so

161
00:08:24,600 --> 00:08:22,449
interesting thing you the contrast

162
00:08:29,010 --> 00:08:24,610
between Earth and Mars to me is striking

163
00:08:30,659 --> 00:08:29,020

Mars Mars Mars isn't horrible and and

164

00:08:33,060 --> 00:08:30,669

it's surprising that it's not covered

165

00:08:34,920 --> 00:08:33,070

with life maybe you can take the other

166

00:08:38,610 --> 00:08:34,930

perspective that it's surprising that

167

00:08:40,409 --> 00:08:38,620

earth is so covered with life and I when

168

00:08:42,240 --> 00:08:40,419

I'm teaching my strongly class I point

169

00:08:43,920 --> 00:08:42,250

this out you know and I often say you

170

00:08:46,139 --> 00:08:43,930

can't swing a dead cat without hitting

171

00:08:48,900 --> 00:08:46,149

something that's alive here on earth and

172

00:08:51,720 --> 00:08:48,910

that's really that's really amazing it's

173

00:08:54,840 --> 00:08:51,730

just carpeted with life and it's obvious

174

00:08:57,060 --> 00:08:54,850

that this is a living planet and you

175

00:08:58,620 --> 00:08:57,070

contrast this with the moon you know

176

00:08:59,670 --> 00:08:58,630

which where you're not so surprised

177

00:09:01,800 --> 00:08:59,680

there's no life there there's no

178

00:09:03,660 --> 00:09:01,810

atmosphere so it's an extreme

179

00:09:06,150 --> 00:09:03,670

temperature variation so that's not so

180

00:09:10,079 --> 00:09:06,160

surprising but it's surprising that Mars

181

00:09:12,269 --> 00:09:10,089

is as devoid of life as it is you would

182

00:09:13,560 --> 00:09:12,279

I would have thought that there would

183

00:09:15,180 --> 00:09:13,570

have been a better chance for life on

184

00:09:17,340 --> 00:09:15,190

Mars and we still might find life on

185

00:09:19,439 --> 00:09:17,350

Mars but it's not clearly not easy to

186

00:09:23,370 --> 00:09:19,449

find but life on Earth is very easy to

187

00:09:25,829 --> 00:09:23,380

find yeah I wanted to actually just jump

188

00:09:28,439 --> 00:09:25,839

right into a really serious topic and

189

00:09:32,610 --> 00:09:28,449

that I greatly admire you for tackling

190

00:09:36,449 --> 00:09:32,620

and that is I wanted to discuss your

191

00:09:38,220 --> 00:09:36,459

talk at max planck and go over the paper

192

00:09:42,329 --> 00:09:38,230

that you're writing

193

00:09:45,810 --> 00:09:42,339

do you mind bringing that up Kevin yeah

194

00:09:48,630 --> 00:09:45,820

I this this year I presented a paper at

195

00:09:49,949 --> 00:09:48,640

the maximum entropy and Bayesian methods

196

00:09:52,050 --> 00:09:49,959

and science and engineering conference

197

00:09:55,650 --> 00:09:52,060

it was held at the months of Planck

198

00:09:57,800 --> 00:09:55,660

Institute for plasma physics in Garching

199

00:10:01,940 --> 00:09:57,810

Germany which is just north of Enoch

200

00:10:04,970 --> 00:10:01,950

and that's a conference I've I've gone

201
00:10:10,370 --> 00:10:04,980
to since 1997 so I've attended you know

202
00:10:12,440 --> 00:10:10,380
for over 20 years and and I've been

203
00:10:14,870 --> 00:10:12,450
always been impressed by a number of

204
00:10:17,600 --> 00:10:14,880
people at that meeting and how they are

205
00:10:19,250 --> 00:10:17,610
always pushing the limits always trying

206
00:10:22,850 --> 00:10:19,260
to do something new and interesting and

207
00:10:25,820 --> 00:10:22,860
I try to do that every year myself most

208
00:10:29,960 --> 00:10:25,830
of my work there has been theoretical

209
00:10:32,750 --> 00:10:29,970
and this year I'd thought to do

210
00:10:34,910 --> 00:10:32,760
something related to estimating the

211
00:10:37,180 --> 00:10:34,920
flight characteristics of anomalous

212
00:10:40,280 --> 00:10:37,190
aerial vehicles and looking at um

213
00:10:43,730 --> 00:10:40,290

unidentified aerial vehicles UAVs and

214

00:10:46,220 --> 00:10:43,740

and estimating their accelerations more

215

00:10:49,690 --> 00:10:46,230

carefully by you know by looking a

216

00:10:51,890 --> 00:10:49,700

special a set of cases where you've had

217

00:10:56,870 --> 00:10:51,900

multiple witnesses with beautiful

218

00:10:59,269 --> 00:10:56,880

imaging modalities yes there's a handful

219

00:11:01,490 --> 00:10:59,279

of well documented encounters as it says

220

00:11:03,230 --> 00:11:01,500

in your paper including the 2004

221

00:11:04,640 --> 00:11:03,240

encounters with the Nimitz carrier group

222

00:11:08,210 --> 00:11:04,650

off the coast of California

223

00:11:13,130 --> 00:11:08,220

and I found that fascinating can you go

224

00:11:15,170 --> 00:11:13,140

into that topic yes 2004 encounters I

225

00:11:19,340 --> 00:11:15,180

think are have been pretty well

226

00:11:23,150 --> 00:11:19,350

publicized at this point they for a

227

00:11:25,840 --> 00:11:23,160

period of about two weeks the intimates

228

00:11:28,400 --> 00:11:25,850

carrier group had been detecting

229

00:11:31,180 --> 00:11:28,410

anomalous aerial vehicles in the area of

230

00:11:32,960 --> 00:11:31,190

Southern California they would basically

231

00:11:36,800 --> 00:11:32,970

appear on radar

232

00:11:38,750 --> 00:11:36,810

at about 80,000 feet and dropped to

233

00:11:42,620 --> 00:11:38,760

around 28,000 feet and tracked south

234

00:11:44,270 --> 00:11:42,630

from Ron Catalina Island South to near

235

00:11:49,280 --> 00:11:44,280

Guadalupe Island off the coast of Baja

236

00:11:54,680 --> 00:11:49,290

Mexico and in in at least one occasion

237

00:11:56,930 --> 00:11:54,690

they had redirected a training mission

238

00:11:59,570 --> 00:11:56,940

to intercept one of these vehicles that

239

00:12:01,660 --> 00:11:59,580

had that had basically moved into the

240

00:12:06,530 --> 00:12:01,670

training area so it posed a hazard and

241

00:12:10,610 --> 00:12:06,540

they so that was the flights led by

242

00:12:13,580 --> 00:12:10,620

commander flavor so they visually come

243

00:12:16,190 --> 00:12:13,590

you encountered these these craft and

244

00:12:18,770 --> 00:12:16,200

described them as large white Tic Tacs

245

00:12:25,780 --> 00:12:18,780

basically a white butane tank shaped

246

00:12:29,330 --> 00:12:25,790

object about the same size as a bean and

247

00:12:32,870 --> 00:12:29,340

when they come tried to engage with this

248

00:12:36,230 --> 00:12:32,880

object or get close to it the craft was

249

00:12:39,080 --> 00:12:36,240

described as as taking off like like as

250

00:12:43,460 --> 00:12:39,090

if it was shot from a rifle so it was it

251
00:12:47,270 --> 00:12:43,470
had very high acceleration accelerations

252
00:12:48,920 --> 00:12:47,280
that nobody nobody would survive the the

253
00:12:50,810 --> 00:12:48,930
craft was decided described as

254
00:12:56,270 --> 00:12:50,820
disappearing from view within a second

255
00:12:58,640 --> 00:12:56,280
or and and commander favor noted that

256
00:13:01,310 --> 00:12:58,650
even if you have a airplane going at

257
00:13:04,040 --> 00:13:01,320
Mach 3 it still takes 10 seconds or so

258
00:13:06,170 --> 00:13:04,050
before it gets out of view so so these

259
00:13:08,390 --> 00:13:06,180
this these objects accelerated much

260
00:13:09,170 --> 00:13:08,400
faster than their aircraft I'm glad

261
00:13:11,840 --> 00:13:09,180
you're bringing that up

262
00:13:14,060 --> 00:13:11,850
Kevin I'm sorry to interject we had a

263
00:13:16,910 --> 00:13:14,070

fascinating discussion with some

264

00:13:19,580 --> 00:13:16,920

gentlemen that were on the US estimates

265

00:13:21,380 --> 00:13:19,590

and also USS Princeton and I brought

266

00:13:23,000 --> 00:13:21,390

this up a few times with Frank and some

267

00:13:25,430 --> 00:13:23,010

podcast so I'm sure he already knows

268

00:13:27,740 --> 00:13:25,440

what I'm gonna say but that is I

269

00:13:28,970 --> 00:13:27,750

actually asked one of the gentlemen I

270

00:13:30,230 --> 00:13:28,980

think it might have been Frank will

271

00:13:33,110 --> 00:13:30,240

refresh my memory

272

00:13:38,470 --> 00:13:33,120

he was very poor he's yeah from the USS

273

00:13:42,410 --> 00:13:38,480

Princeton right and he I asked the group

274

00:13:46,430 --> 00:13:42,420

if they felt that the craft that they

275

00:13:49,760 --> 00:13:46,440

saw or the anomaly they saw may have

276

00:13:52,130 --> 00:13:49,770

been derived from été technology or was

277

00:13:57,950 --> 00:13:52,140

that one of ours so to speak meaning

278

00:13:59,960 --> 00:13:57,960

maybe a government owned vehicle and it

279

00:14:03,020 --> 00:13:59,970

was really surprising to hear Gary

280

00:14:07,850 --> 00:14:03,030

Voorhees say he felt it was one of ours

281

00:14:09,680 --> 00:14:07,860

now you just mentioned speed if it was

282

00:14:12,080 --> 00:14:09,690

one of ours let's just pretend for a

283

00:14:13,820 --> 00:14:12,090

second it was do we have anything that

284

00:14:16,130 --> 00:14:13,830

can go at that speed and like you said

285

00:14:22,310 --> 00:14:16,140

no human could be in a craft like that

286

00:14:23,810 --> 00:14:22,320

at that speed right yes you could

287

00:14:25,760 --> 00:14:23,820

potentially have

288

00:14:28,850 --> 00:14:25,770

a drone or something or an autonomous

289

00:14:34,250 --> 00:14:28,860

craft that moves at those speeds it gets

290

00:14:39,800 --> 00:14:34,260

tricky the in that case there were

291

00:14:41,870 --> 00:14:39,810

basically there were several aspects of

292

00:14:44,510 --> 00:14:41,880

the encounters in the Nimitz case that I

293

00:14:48,920 --> 00:14:44,520

analyzed one was from the radar data

294

00:14:53,840 --> 00:14:48,930

from senior chief Kevin day also in the

295

00:14:55,910 --> 00:14:53,850

USS Princeton where he was watching

296

00:15:01,880 --> 00:14:55,920

these things dropping from 28,000 feet

297

00:15:05,960 --> 00:15:01,890

to sea level in in on the order of a

298

00:15:07,760 --> 00:15:05,970

second or so and there it was yeah they

299

00:15:10,970 --> 00:15:07,770

were basically dropping from 28,000 feet

300

00:15:12,470 --> 00:15:10,980

to sea level and 0.78 seconds and so if

301
00:15:14,210 --> 00:15:12,480
you estimate the accelerations in that

302
00:15:17,570 --> 00:15:14,220
case you're coming up with numbers on

303
00:15:21,020 --> 00:15:17,580
the order of about 5,600 G's of

304
00:15:27,110 --> 00:15:21,030
acceleration which is really insane the

305
00:15:31,160 --> 00:15:27,120
a person can withstand about 25 G's for

306
00:15:36,230 --> 00:15:31,170
very short periods of time our fastest

307
00:15:38,570 --> 00:15:36,240
missiles that basically can handle on

308
00:15:42,830 --> 00:15:38,580
the other airframes can handle on the

309
00:15:44,630 --> 00:15:42,840
order of 50 G's and they can maneuver

310
00:15:46,670 --> 00:15:44,640
they can continue maneuvering at

311
00:15:49,640 --> 00:15:46,680
accelerations of 35 G's but that's well

312
00:15:51,260 --> 00:15:49,650
below their 5,000 trees so even if these

313
00:15:54,050 --> 00:15:51,270

were drones it would really be

314

00:15:56,000 --> 00:15:54,060

surprising I would I don't know I

315

00:15:58,700 --> 00:15:56,010

honestly don't know what to think about

316

00:16:00,530 --> 00:15:58,710

it because it's you can't rule out the

317

00:16:02,330 --> 00:16:00,540

possibility that these are from earth

318

00:16:05,630 --> 00:16:02,340

you can't rule out the possibility that

319

00:16:07,880 --> 00:16:05,640

someone made them here on earth I would

320

00:16:11,450 --> 00:16:07,890

be surprised that they wouldn't be used

321

00:16:12,860 --> 00:16:11,460

more often if they were made here on

322

00:16:17,450 --> 00:16:12,870

earth because that's really an

323

00:16:19,130 --> 00:16:17,460

exceptional technology proving that some

324

00:16:22,820 --> 00:16:19,140

things extraterrestrial is incredibly

325

00:16:25,940 --> 00:16:22,830

difficult you a lot of people try to

326

00:16:28,190 --> 00:16:25,950

focus on isotope ratios and things like

327

00:16:30,440 --> 00:16:28,200

this but you know you we can manipulate

328

00:16:31,880 --> 00:16:30,450

isotope ratios so that's not that's not

329

00:16:33,890 --> 00:16:31,890

a hard thing to do we know how to do

330

00:16:35,760 --> 00:16:33,900

that that's what we do and we when we

331

00:16:38,040 --> 00:16:35,770

isolate uranium for

332

00:16:39,690 --> 00:16:38,050

you know for making nuclear weapons

333

00:16:41,370 --> 00:16:39,700

that's where you playing with isotope

334

00:16:42,030 --> 00:16:41,380

ratios it's a hard thing to do but it

335

00:16:44,370 --> 00:16:42,040

can be done

336

00:16:47,310 --> 00:16:44,380

so isotope ratios don't prove that

337

00:16:48,510 --> 00:16:47,320

something's extraterrestrial you've to

338

00:16:50,640 --> 00:16:48,520

prove that something is extraterrestrial

339

00:16:55,590 --> 00:16:50,650

you'll probably have to drag an alien

340

00:16:57,510 --> 00:16:55,600

off of it convince anyone because

341

00:16:59,190 --> 00:16:57,520

otherwise you know you could you could

342

00:17:01,440 --> 00:16:59,200

get some really interesting tech that no

343

00:17:03,030 --> 00:17:01,450

one's ever seen before but just because

344

00:17:04,650 --> 00:17:03,040

no one's seen it before doesn't mean

345

00:17:09,060 --> 00:17:04,660

that it wasn't made here on earth so

346

00:17:11,970 --> 00:17:09,070

it's it's a very difficult issue okay

347

00:17:13,440 --> 00:17:11,980

wanted go ahead Frank yeah I just don't

348

00:17:15,810 --> 00:17:13,450

want to jump in that we were talking a

349

00:17:18,810 --> 00:17:15,820

little bit about the Nimitz case and you

350

00:17:21,390 --> 00:17:18,820

are involved with Kevin day on a you ap

351

00:17:23,400 --> 00:17:21,400

pattern detection mission out near

352

00:17:25,199 --> 00:17:23,410

Catalina Island generally the

353

00:17:27,960 --> 00:17:25,209

neighborhood that this case took place

354

00:17:30,300 --> 00:17:27,970

in and I was hoping you tell us a little

355

00:17:37,340 --> 00:17:30,310

bit about how you got involved in all

356

00:17:44,090 --> 00:17:41,190

really excited that Kevin day really

357

00:17:47,760 --> 00:17:44,100

spearheaded this project and he's

358

00:17:51,960 --> 00:17:47,770

extremely motivated and I really respect

359

00:17:54,000 --> 00:17:51,970

him for that I get that you know he was

360

00:17:55,800 --> 00:17:54,010

involved with these encounters and he

361

00:17:58,620 --> 00:17:55,810

wants to know what they are and I and I

362

00:18:02,580 --> 00:17:58,630

and I really really appreciate that and

363

00:18:04,940 --> 00:18:02,590

I'm really feel honored to be able to

364

00:18:10,770 --> 00:18:04,950

you know help with this and work on this

365

00:18:14,520 --> 00:18:10,780

so the idea basically is to to go back

366

00:18:17,310 --> 00:18:14,530

to Catalina Island and south of Catalina

367

00:18:21,030 --> 00:18:17,320

Island with with a ship and and actually

368

00:18:23,760 --> 00:18:21,040

look for these things we the idea was

369

00:18:31,290 --> 00:18:23,770

that they had detected them in November

370

00:18:32,550 --> 00:18:31,300

of what was it 2004 yes sir so we're

371

00:18:34,170 --> 00:18:32,560

going to go back at the same time of

372

00:18:36,630 --> 00:18:34,180

year and and hope that they're still

373

00:18:40,110 --> 00:18:36,640

around or others like them will still be

374

00:18:44,870 --> 00:18:40,120

around and we're gonna go with equipment

375

00:18:47,460 --> 00:18:44,880

and try to try to find them try to

376

00:18:48,340 --> 00:18:47,470

measure any quality as we can about them

377

00:18:55,810 --> 00:18:48,350

and

378

00:18:57,700 --> 00:18:55,820

in that neighborhood regarding a green

379

00:18:59,649 --> 00:18:57,710

ball of light that actually descended

380

00:19:01,659 --> 00:18:59,659

into the ocean in the area can you tell

381

00:19:06,070 --> 00:19:01,669

us a little bit about that that's a

382

00:19:07,450 --> 00:19:06,080

great story but for me I really

383

00:19:08,980 --> 00:19:07,460

appreciate the story because he's a

384

00:19:12,340 --> 00:19:08,990

close friend of mine we've been friends

385

00:19:16,960 --> 00:19:12,350

since high school and but it's but it's

386

00:19:19,419 --> 00:19:16,970

it's a typical UFO sighting in that when

387

00:19:21,159 --> 00:19:19,429

you when you tell this story you know

388

00:19:23,830 --> 00:19:21,169

there's always some aspect of this where

389

00:19:27,340 --> 00:19:23,840

somebody can hahaha and laugh it off and

390

00:19:29,789 --> 00:19:27,350

just pretend it didn't happen but yeah

391

00:19:31,930 --> 00:19:29,799

he my good friend his name's Joey

392

00:19:34,960 --> 00:19:31,940

I'll just give the first names his

393

00:19:36,549 --> 00:19:34,970

name's Joey and he was the for for a

394

00:19:40,419 --> 00:19:36,559

good period of time he was the head

395

00:19:43,930 --> 00:19:40,429

bartender at the ritz-carlton hotel in

396

00:19:46,570 --> 00:19:43,940

Laguna Beach and there was one day he

397

00:19:48,899 --> 00:19:46,580

was out in the evening he was out taking

398

00:19:51,279 --> 00:19:48,909

a break so he's out on the on the patio

399

00:19:53,649 --> 00:19:51,289

having a cigarette yeah I believe in

400

00:19:55,899 --> 00:19:53,659

he's he was just looking out at the

401
00:19:59,440 --> 00:19:55,909
water and and from from that point you

402
00:20:01,180 --> 00:19:59,450
can see Catalina from the shore and so

403
00:20:04,539 --> 00:20:01,190
he's looking out over the water and he

404
00:20:06,580 --> 00:20:04,549
saw this this bright green light he said

405
00:20:08,710 --> 00:20:06,590
it he described it as literally shooting

406
00:20:10,539 --> 00:20:08,720
down from space it looked like it came

407
00:20:13,749 --> 00:20:10,549
from space and went right into the ocean

408
00:20:15,159 --> 00:20:13,759
and he said it was so fast that had he

409
00:20:18,999 --> 00:20:15,169
blinked he would have missed it

410
00:20:22,600 --> 00:20:19,009
so okay so familiar yeah so you saw this

411
00:20:24,700 --> 00:20:22,610
thing and he was stunned and thought oh

412
00:20:27,070 --> 00:20:24,710
my god was that real did I really see

413
00:20:28,659 --> 00:20:27,080

what I just thought I saw and he asked

414

00:20:30,129 --> 00:20:28,669

the people next to him you know there

415

00:20:32,320 --> 00:20:30,139

are people standing in your body as some

416

00:20:34,210 --> 00:20:32,330

of the the other guests at the hotel if

417

00:20:36,279 --> 00:20:34,220

they had seen it and nobody had seen it

418

00:20:38,379 --> 00:20:36,289

and so so he started just running around

419

00:20:39,659 --> 00:20:38,389

asking everybody who was outside if they

420

00:20:41,919 --> 00:20:39,669

had seen this thing and he was

421

00:20:43,240 --> 00:20:41,929

desperately fine trying to find someone

422

00:20:46,389 --> 00:20:43,250

else who had noticed it and nobody

423

00:20:48,700 --> 00:20:46,399

noticed and and he was feeling pretty

424

00:20:50,399 --> 00:20:48,710

despondent about it and he ended up he

425

00:20:52,779 --> 00:20:50,409

decided to run up to the restaurant

426

00:20:54,190 --> 00:20:52,789

because there's an open-air section and

427

00:20:56,740 --> 00:20:54,200

he ran up to the restaurant and was

428

00:20:58,930 --> 00:20:56,750

asking around and he went to every table

429

00:21:01,260 --> 00:20:58,940

and you know asked if anybody had seen

430

00:21:02,700 --> 00:21:01,270

anything interesting and nobody had

431

00:21:04,110 --> 00:21:02,710

and there was one table off in the

432

00:21:06,720 --> 00:21:04,120

corner and they were laughing and

433

00:21:08,160 --> 00:21:06,730

laughing and so he was a little hesitant

434

00:21:09,840 --> 00:21:08,170

to go over there but finally mustered

435

00:21:11,910 --> 00:21:09,850

the courage and walked over and asked

436

00:21:14,310 --> 00:21:11,920

them and they stopped and listened and

437

00:21:16,230 --> 00:21:14,320

he told them what happened and they said

438

00:21:18,570 --> 00:21:16,240

oh we were well we were just laughing

439

00:21:19,440 --> 00:21:18,580

because this guy they pointed one of the

440

00:21:25,050 --> 00:21:19,450

guys to the table

441

00:21:27,750 --> 00:21:25,060

this guy just saw and so he was

442

00:21:29,580 --> 00:21:27,760

vindicated you know and yeah it was so

443

00:21:31,950 --> 00:21:29,590

quick it was like a flash it was just an

444

00:21:33,780 --> 00:21:31,960

instant it was so quick you know his

445

00:21:35,880 --> 00:21:33,790

poor guys friends were all laughing at

446

00:21:37,800 --> 00:21:35,890

him so he was glad that you know Joey

447

00:21:43,170 --> 00:21:37,810

had come over and talk to him because he

448

00:21:45,120 --> 00:21:43,180

was vindicated as well but what do you

449

00:21:47,070 --> 00:21:45,130

make of that well you can't do anything

450

00:21:49,380 --> 00:21:47,080

with it scientifically it's a flash of

451
00:21:53,130 --> 00:21:49,390
light you know and and you know you'll

452
00:21:58,170 --> 00:21:53,140
hear on Laura most people will say oh it

453
00:22:00,510 --> 00:21:58,180
could have been anything that's that's

454
00:22:02,790 --> 00:22:00,520
what it is and unfortunately most bars

455
00:22:19,860 --> 00:22:02,800
don't have radar systems set up there so

456
00:22:22,640 --> 00:22:19,870
they would never like now have you heard

457
00:22:28,350 --> 00:22:22,650
this story before

458
00:22:35,210 --> 00:22:28,360
yeah have you heard the story before the

459
00:22:43,680 --> 00:22:38,820
it was in the early 2000s 2001 2002

460
00:22:49,560 --> 00:22:43,690
right around there okay so I was working

461
00:22:51,000 --> 00:22:49,570
at NASA from 2000 to 2001 to 2005 I'm

462
00:23:02,310 --> 00:22:51,010
glad he was able to work up the courage

463
00:23:03,720 --> 00:23:02,320

to tell you it is and so I had a few

464

00:23:05,660 --> 00:23:03,730

questions for you about the Nimitz

465

00:23:08,760 --> 00:23:05,670

because I was still on that topic and

466

00:23:13,650 --> 00:23:08,770

wanted to ask you a few things about it

467

00:23:15,780 --> 00:23:13,660

and that is regarding the NIP the Nimitz

468

00:23:19,850 --> 00:23:15,790

sighting

469

00:23:23,010 --> 00:23:19,860

you did or did not rule out that it was

470

00:23:24,659 --> 00:23:23,020

et related I already know the answer to

471

00:23:29,460 --> 00:23:24,669

that but I want our listeners to hear

472

00:23:32,100 --> 00:23:29,470

why you didn't say this is et technology

473

00:23:38,159 --> 00:23:32,110

how did you come to that conclusion if

474

00:23:41,370 --> 00:23:38,169

that was the case and why mainly because

475

00:23:43,200 --> 00:23:41,380

to show that something is et technology

476

00:23:48,960 --> 00:23:43,210

you would have to demonstrate that it

477

00:23:51,299 --> 00:23:48,970

was developed by aliens and I would have

478

00:23:53,190 --> 00:23:51,309

no way of doing that unless I actually

479

00:23:54,690 --> 00:23:53,200

saw the aliens who made it I don't know

480

00:23:57,000 --> 00:23:54,700

any other way to do that I can't I

481

00:23:59,520 --> 00:23:57,010

couldn't easily rule out that some

482

00:24:02,130 --> 00:23:59,530

clever person you know like Elon Musk or

483

00:24:04,080 --> 00:24:02,140

somebody has some secret or Bob Bigelow

484

00:24:07,169 --> 00:24:04,090

has some secret project where they've

485

00:24:09,000 --> 00:24:07,179

basically designed this themselves okay

486

00:24:10,669 --> 00:24:09,010

so you can't you can't easily rule that

487

00:24:14,820 --> 00:24:10,679

out

488

00:24:16,620 --> 00:24:14,830

it could be Chinese and I'm glad you

489

00:24:18,330 --> 00:24:16,630

brought that up because my next question

490

00:24:21,270 --> 00:24:18,340

that kind of is a nice segue into the

491

00:24:23,700 --> 00:24:21,280

next question I have and that is I've

492

00:24:25,980 --> 00:24:23,710

heard it said and so this is a

493

00:24:27,750 --> 00:24:25,990

stereotype and assumption it's a blanket

494

00:24:30,150 --> 00:24:27,760

statement so I'm just gonna go ahead and

495

00:24:34,080 --> 00:24:30,160

preface that what I have to say with

496

00:24:37,650 --> 00:24:34,090

that and that is I've heard all my life

497

00:24:41,039 --> 00:24:37,660

that the you the military at least in

498

00:24:43,350 --> 00:24:41,049

first world countries are allegedly 10

499

00:24:46,590 --> 00:24:43,360

to 20 years ahead of time regarding

500

00:24:50,580 --> 00:24:46,600

their technology so going along that

501
00:24:52,680 --> 00:24:50,590
idea if that's true does that lend any

502
00:24:54,930 --> 00:24:52,690
credibility to the possibility that the

503
00:24:56,390 --> 00:24:54,940
tic-tock may have been one of ours is

504
00:24:59,820 --> 00:24:56,400
that possible

505
00:25:02,250 --> 00:24:59,830
it's still possible it's something I

506
00:25:05,310 --> 00:25:02,260
can't rule out the it makes it

507
00:25:11,700 --> 00:25:05,320
surprising because if you II had this

508
00:25:14,909 --> 00:25:11,710
technology in 2004 then all the

509
00:25:16,590 --> 00:25:14,919
aeronautical engineers in America or in

510
00:25:18,360 --> 00:25:16,600
the world are being played for fools I

511
00:25:21,530 --> 00:25:18,370
mean this is this breaks all the rules

512
00:25:27,000 --> 00:25:21,540
of aeronautical engineering and and so

513
00:25:28,680 --> 00:25:27,010

we're I mean then NASA NASA itself is

514

00:25:30,630 --> 00:25:28,690

being played for fools because we

515

00:25:32,340 --> 00:25:30,640

got these huge chemical rockets that

516

00:25:34,980 --> 00:25:32,350

were using to lift materials off the

517

00:25:36,960 --> 00:25:34,990

planet where you know apparently we've

518

00:25:38,610 --> 00:25:36,970

got you know if the if it's true that

519

00:25:41,490 --> 00:25:38,620

somebody on earth has craft that can

520

00:25:43,380 --> 00:25:41,500

accelerate at 5,000 G at 5,000 G you can

521

00:25:49,500 --> 00:25:43,390

get from one side of the galaxy to the

522

00:25:51,450 --> 00:25:49,510

other and in a matter of weeks so this

523

00:25:53,460 --> 00:25:51,460

is this would be really shocking that we

524

00:25:55,890 --> 00:25:53,470

would have had this technology now for

525

00:26:00,810 --> 00:25:55,900

15 years and we haven't seen it used

526
00:26:02,550 --> 00:26:00,820
anywhere that I find that surprising now

527
00:26:04,200 --> 00:26:02,560
the question is is that more support

528
00:26:05,970 --> 00:26:04,210
would that be more surprising than it

529
00:26:08,310 --> 00:26:05,980
being alien technology well I can't

530
00:26:12,930 --> 00:26:08,320
actually say that so it's this is still

531
00:26:15,930 --> 00:26:12,940
an unresolved issue okay and I still

532
00:26:19,080 --> 00:26:15,940
have another question and that is did

533
00:26:22,830 --> 00:26:19,090
you get the opportunity to view Dave

534
00:26:26,780 --> 00:26:22,840
babies USS Nimitz documentary that he

535
00:26:30,090 --> 00:26:26,790
did do you feel also was that a good

536
00:26:35,610 --> 00:26:30,100
analysis and representation of what

537
00:26:38,190 --> 00:26:35,620
occurred you know from talking to Kevin

538
00:26:42,630 --> 00:26:38,200

day personally our you know and from

539

00:26:48,380 --> 00:26:42,640

what I've read from the analysis of the

540

00:26:54,570 --> 00:26:51,390

was actually pretty good pretty good

541

00:26:56,070 --> 00:26:54,580

depiction of what happened okay Frank

542

00:26:58,710 --> 00:26:56,080

you had a question I'm sorry in a room

543

00:27:03,990 --> 00:26:58,720

yeah you had mentioned the acceleration

544

00:27:06,660 --> 00:27:04,000

at the 5,600 G's would be able to allow

545

00:27:08,550 --> 00:27:06,670

somebody to travel across the galaxy in

546

00:27:11,870 --> 00:27:08,560

a matter of weeks 100,000 light years

547

00:27:15,000 --> 00:27:11,880

now and also you're going out to a

548

00:27:17,400 --> 00:27:15,010

Catalina III I think that's about right

549

00:27:20,190 --> 00:27:17,410

if I'm wrong I please jump in let me now

550

00:27:23,850 --> 00:27:20,200

that's that's great and you're going out

551
00:27:27,960 --> 00:27:23,860
to Catalina you know there's always been

552
00:27:30,210 --> 00:27:27,970
talk about a literal base in the

553
00:27:33,680 --> 00:27:30,220
Catalina area chase klutz key went out

554
00:27:35,610 --> 00:27:33,690
and did a search with a little mission

555
00:27:38,200 --> 00:27:35,620
regarding

556
00:27:39,250 --> 00:27:38,210
seeing some underwater photographs of

557
00:27:41,110 --> 00:27:39,260
what looked like it might have been a

558
00:27:44,530 --> 00:27:41,120
structure it turned out it wasn't but

559
00:27:46,210 --> 00:27:44,540
there has always been that talk what do

560
00:27:48,160 --> 00:27:46,220
you think about that the possibility if

561
00:27:50,289 --> 00:27:48,170
there are a lot of these type of

562
00:27:51,850 --> 00:27:50,299
sightings and we're getting a lot of

563
00:27:53,950 --> 00:27:51,860

them that it's not entirely just

564

00:28:05,530 --> 00:27:53,960

traversing the galaxy but they're

565

00:28:08,970 --> 00:28:05,540

literally right here I said from your

566

00:28:14,460 --> 00:28:08,980

you know from his a tip studies did they

567

00:28:16,960 --> 00:28:14,470

were they able to assess whether

568

00:28:19,210 --> 00:28:16,970

basically how many of these objects are

569

00:28:21,820 --> 00:28:19,220

on earth and a given time I said are

570

00:28:23,320 --> 00:28:21,830

there tens of these things hundreds of

571

00:28:25,810 --> 00:28:23,330

these things thousands of these things

572

00:28:27,669 --> 00:28:25,820

present and and he just didn't know I

573

00:28:30,480 --> 00:28:27,679

mean this is this would be a very hard

574

00:28:34,180 --> 00:28:30,490

thing to collect data on of course but

575

00:28:37,860 --> 00:28:34,190

so yeah it's not it's not obvious that

576

00:28:40,090 --> 00:28:37,870

there there's not a base here earth

577

00:28:43,419 --> 00:28:40,100

let's be honest Earth is an interesting

578

00:28:45,789 --> 00:28:43,429

place we live here and it's interesting

579

00:28:48,130 --> 00:28:45,799

to us so I said it's an interesting

580

00:28:50,320 --> 00:28:48,140

place you know especially compared to

581

00:28:53,440 --> 00:28:50,330

the other bodies we've we've explored in

582

00:28:56,080 --> 00:28:53,450

our solar system so so anybody studying

583

00:28:58,750 --> 00:28:56,090

earth I would imagine that you would

584

00:29:02,200 --> 00:28:58,760

spend time here that would be the

585

00:29:05,080 --> 00:29:02,210

sensible thing to do okay and I did have

586

00:29:08,200 --> 00:29:05,090

a question and that is can you discuss

587

00:29:09,909 --> 00:29:08,210

the attitudes of scientists and the fact

588

00:29:12,310 --> 00:29:09,919

that scientists need to get more

589

00:29:17,080 --> 00:29:12,320

involved in the kind of topics that

590

00:29:23,860 --> 00:29:17,090

we're talking about right now all these

591

00:29:27,850 --> 00:29:23,870

issues and and the one of the

592

00:29:30,159 --> 00:29:27,860

difficulties in science is that there

593

00:29:33,580 --> 00:29:30,169

are a lot of interesting things to study

594

00:29:36,000 --> 00:29:33,590

and you just don't have the time and

595

00:29:38,140 --> 00:29:36,010

resources to study all of these things I

596

00:29:40,000 --> 00:29:38,150

typically tend to take on too many

597

00:29:45,669 --> 00:29:40,010

projects because I can't say no to

598

00:29:47,379 --> 00:29:45,679

something really interesting don't make

599

00:29:48,669 --> 00:29:47,389

a lot of progress and I love them

600

00:29:53,680 --> 00:29:48,679

of them because they're just under the

601
00:29:56,409 --> 00:29:53,690
time and energy but but so what you

602
00:30:00,190 --> 00:29:56,419
often do is you performs a sort of

603
00:30:02,169 --> 00:30:00,200
triage you look at a problem and you

604
00:30:05,169 --> 00:30:02,179
decide whether this is worth studying

605
00:30:09,789 --> 00:30:05,179
and scientists do this all the time and

606
00:30:12,489 --> 00:30:09,799
and unfortunately UFOs have been you

607
00:30:14,440 --> 00:30:12,499
know triage and basically thrown into

608
00:30:17,259 --> 00:30:14,450
the pile of not worth studying because

609
00:30:19,209 --> 00:30:17,269
there's probably nothing there now why

610
00:30:21,329 --> 00:30:19,219
is that the case there's actually a good

611
00:30:24,389 --> 00:30:21,339
reason for this

612
00:30:29,199 --> 00:30:24,399
unfortunately this goes back to our

613
00:30:32,499 --> 00:30:29,209

prior expectations in the 1940s when

614

00:30:34,810 --> 00:30:32,509

these things were first when it was

615

00:30:37,629 --> 00:30:34,820

first made publicly known that these

616

00:30:40,079 --> 00:30:37,639

things were encountered so you have 1947

617

00:30:44,289 --> 00:30:40,089

was a big year you had Kenneth Arnold

618

00:30:47,529 --> 00:30:44,299

saw the half moon saucer-shaped craft

619

00:30:49,569 --> 00:30:47,539

near Mount Washington a few weeks later

620

00:30:52,149 --> 00:30:49,579

you have the Roswell incident later

621

00:30:54,459 --> 00:30:52,159

later on another couple of weeks you

622

00:30:58,739 --> 00:30:54,469

have the Puget Sound incident so you've

623

00:31:01,629 --> 00:30:58,749

got a few things going on that made UFOs

624

00:31:04,060 --> 00:31:01,639

UFOs basically entered the public

625

00:31:06,549 --> 00:31:04,070

consciousness in the United States in

626
00:31:08,199 --> 00:31:06,559
that in that year now that that was that

627
00:31:09,459 --> 00:31:08,209
was not at all the first year that these

628
00:31:11,379 --> 00:31:09,469
things were ever seen they've got

629
00:31:14,619 --> 00:31:11,389
sightings going back to the 1800s and

630
00:31:17,109 --> 00:31:14,629
before but this is when the public was

631
00:31:19,779 --> 00:31:17,119
became more widely known that this was

632
00:31:22,269 --> 00:31:19,789
good this was a possibility and if you

633
00:31:27,190 --> 00:31:22,279
consider the situation in 1947 you're

634
00:31:31,690 --> 00:31:27,200
ten years before Sputnik 2 weeks before

635
00:31:34,539 --> 00:31:31,700
Sputnik the the Royal astronomer if

636
00:31:37,329 --> 00:31:34,549
Britain called space travel bunk that

637
00:31:41,199 --> 00:31:37,339
was two weeks before sperner's you have

638
00:31:44,289 --> 00:31:41,209

you have a class of scientists who ten

639

00:31:46,719 --> 00:31:44,299

years before Sputnik didn't think space

640

00:31:48,339 --> 00:31:46,729

travel was possible you had a lot of

641

00:31:50,979 --> 00:31:48,349

people who seriously didn't think it was

642

00:31:55,389 --> 00:31:50,989

even a possible thing you could do and

643

00:31:57,190 --> 00:31:55,399

in 1947 we really didn't have a lot of

644

00:31:58,899 --> 00:31:57,200

information about what the planets in

645

00:31:59,280 --> 00:31:58,909

our solar system were like we knew what

646

00:32:00,480 --> 00:31:59,290

there

647

00:32:02,460 --> 00:32:00,490

for light because you can get that

648

00:32:04,110 --> 00:32:02,470

information from spectra but we didn't

649

00:32:06,960 --> 00:32:04,120

know whether there was life on Mars or

650

00:32:08,880 --> 00:32:06,970

not I have a little golden book of the

651
00:32:10,980 --> 00:32:08,890
planets that has a picture of what Mars

652
00:32:13,080 --> 00:32:10,990
might look like and that in that book

653
00:32:14,730 --> 00:32:13,090
was written in 1968 and has all sorts of

654
00:32:16,020 --> 00:32:14,740
weird life forms on it you know in the

655
00:32:17,370 --> 00:32:16,030
pictures I like showing that to my

656
00:32:20,250 --> 00:32:17,380
astronomy class because it really

657
00:32:21,690 --> 00:32:20,260
highlights her state of ignorance so we

658
00:32:26,340 --> 00:32:21,700
didn't really know what the planets were

659
00:32:28,620 --> 00:32:26,350
like in 1947 and we didn't know whether

660
00:32:31,620 --> 00:32:28,630
there were any planets under around any

661
00:32:33,840 --> 00:32:31,630
other stars that wasn't known until the

662
00:32:35,940 --> 00:32:33,850
1990s when we first discovered

663
00:32:40,350 --> 00:32:35,950

exoplanets and that didn't really take

664

00:32:42,420 --> 00:32:40,360

off until the 2000s so in 1947 we really

665

00:32:44,880 --> 00:32:42,430

had no idea what the universe was like

666

00:32:49,890 --> 00:32:44,890

we didn't know it was possible to travel

667

00:32:52,260 --> 00:32:49,900

through it and could UFOs be alien

668

00:32:53,730 --> 00:32:52,270

spacecraft well probably not that would

669

00:32:55,440 --> 00:32:53,740

be that would be the most reasonable

670

00:32:57,240 --> 00:32:55,450

assessment I mean if you're especially

671

00:33:00,510 --> 00:32:57,250

if you're the belief that space travel

672

00:33:02,280 --> 00:33:00,520

is impossible you're gonna it's much

673

00:33:07,620 --> 00:33:02,290

more likely that UFOs are something else

674

00:33:11,610 --> 00:33:07,630

and so that that attitude basically

675

00:33:13,320 --> 00:33:11,620

prevails to this day and despite the

676

00:33:15,270 --> 00:33:13,330

fact that our prior information about

677

00:33:18,180 --> 00:33:15,280

the universe has changed dramatically

678

00:33:20,490 --> 00:33:18,190

and despite the fact that we ourselves

679

00:33:22,260 --> 00:33:20,500

have visited other worlds and are

680

00:33:24,000 --> 00:33:22,270

planning our own interest other missions

681

00:33:26,690 --> 00:33:24,010

you know NASA is planning to send a

682

00:33:31,290 --> 00:33:26,700

probe to the health to Proxima Centauri

683

00:33:33,390 --> 00:33:31,300

on 2069 the 100 year anniversary of the

684

00:33:35,790 --> 00:33:33,400

moon landings so where we are now

685

00:33:37,320 --> 00:33:35,800

beginning the first steps to

686

00:33:39,390 --> 00:33:37,330

interstellar travel ourselves we're

687

00:33:45,300 --> 00:33:39,400

going to do it we're going to make it

688

00:33:47,750 --> 00:33:45,310

happen and so what's interesting to me

689

00:33:50,430 --> 00:33:47,760

is that despite the fact that our

690

00:33:52,020 --> 00:33:50,440

knowledge about the universe has changed

691

00:33:53,700 --> 00:33:52,030

and our knowledge about the

692

00:33:55,740 --> 00:33:53,710

possibilities has changed that

693

00:33:59,820 --> 00:33:55,750

scientists still think that this is

694

00:34:02,270 --> 00:33:59,830

unreasonable and surprises me and

695

00:34:06,090 --> 00:34:02,280

especially surprises me when there are

696

00:34:08,190 --> 00:34:06,100

SETI efforts going on especially SETI

697

00:34:10,290 --> 00:34:08,200

efforts that are involved in looking for

698

00:34:13,350 --> 00:34:10,300

alien artifacts on the moon

699

00:34:14,730 --> 00:34:13,360

Mars and asteroids and you know the

700

00:34:19,970 --> 00:34:14,740

thinking there is that if you want to

701
00:34:23,580 --> 00:34:19,980
observe earth you can set up a you can

702
00:34:25,680 --> 00:34:23,590
you can the ideas that they might have

703
00:34:29,160 --> 00:34:25,690
set up some observation base on the moon

704
00:34:31,260 --> 00:34:29,170
to observe earth but anybody who's

705
00:34:33,510 --> 00:34:31,270
worked with the remote observing knows

706
00:34:35,220 --> 00:34:33,520
and I've done this on NASA it's much

707
00:34:38,430 --> 00:34:35,230
better to get ground truth why would you

708
00:34:39,840 --> 00:34:38,440
travel light-years to set up a base on

709
00:34:41,630 --> 00:34:39,850
the moon and study Earth from the moon

710
00:34:45,990 --> 00:34:41,640
when you can actually land on the earth

711
00:34:48,810 --> 00:34:46,000
much better to be here and so so now

712
00:34:50,970 --> 00:34:48,820
this answers you know several questions

713
00:34:54,990 --> 00:34:50,980

because this is no no we're back to

714

00:34:57,660 --> 00:34:55,000

could there be a base here yeah I mean

715

00:34:59,970 --> 00:34:57,670

if they have the number of really wild

716

00:35:01,890 --> 00:34:59,980

unexplained cases with the sort of

717

00:35:04,560 --> 00:35:01,900

flight characteristics they picked up

718

00:35:07,500 --> 00:35:04,570

with the nimitz are out there you got to

719

00:35:09,390 --> 00:35:07,510

at least consider it anyway but III was

720

00:35:15,050 --> 00:35:09,400

looking at that one of your slides that

721

00:35:18,900 --> 00:35:15,060

you presented at the seu and you cited a

722

00:35:21,390 --> 00:35:18,910

paper how rare is complex life in the

723

00:35:23,610 --> 00:35:21,400

Milky Way can you answer for the folks

724

00:35:25,680 --> 00:35:23,620

at home well what do you what was meant

725

00:35:31,950 --> 00:35:25,690

by complex life or what are we talking

726

00:35:33,660 --> 00:35:31,960

about here specific organisms I don't

727

00:35:36,210 --> 00:35:33,670

remember the details from that paper but

728

00:35:41,040 --> 00:35:36,220

they basically were doing simulations of

729

00:35:44,300 --> 00:35:41,050

chemistry and biology and and along with

730

00:35:47,250 --> 00:35:44,310

some statistics of the known exoplanet

731

00:35:49,230 --> 00:35:47,260

you know statistics to try to get some

732

00:35:51,270 --> 00:35:49,240

idea of where you might expect to see

733

00:35:59,400 --> 00:35:51,280

and then primitive life would be

734

00:36:02,370 --> 00:35:59,410

something like bacteria may be okay yeah

735

00:36:06,180 --> 00:36:02,380

and actually had an odd question for you

736

00:36:11,220 --> 00:36:06,190

and not that the topic we're talking

737

00:36:14,760 --> 00:36:11,230

about is super normal the topic the

738

00:36:18,440 --> 00:36:14,770

question I had for you Kevin is I wanted

739

00:36:21,330 --> 00:36:18,450

to know do you believe that if there are

740

00:36:24,160 --> 00:36:21,340

ET civilizations whether being the

741

00:36:27,730 --> 00:36:24,170

singular or plural

742

00:36:30,310 --> 00:36:27,740

are on this planet already or visiting

743

00:36:32,890 --> 00:36:30,320

our planet whatever manner or presence

744

00:36:40,540 --> 00:36:32,900

they have here do you believe that they

745

00:36:42,520 --> 00:36:40,550

have a military baby that organized in

746

00:36:44,620 --> 00:36:42,530

other words do they do you feel that

747

00:36:47,560 --> 00:36:44,630

they're capable since they could be

748

00:36:50,920 --> 00:36:47,570

ahead technology wise let's just assume

749

00:36:53,830 --> 00:36:50,930

they are do you think that they would be

750

00:36:55,180 --> 00:36:53,840

that well I don't even know if the word

751

00:36:56,950 --> 00:36:55,190

sophisticated would be very good for

752

00:36:58,510 --> 00:36:56,960

cutting back but do you think they would

753

00:37:00,040 --> 00:36:58,520

be organized in that manner or

754

00:37:04,390 --> 00:37:00,050

structured in that manner their

755

00:37:07,480 --> 00:37:04,400

civilization would like to speculate on

756

00:37:12,070 --> 00:37:07,490

what aliens could be like in in this

757

00:37:13,840 --> 00:37:12,080

sense there are you know there are some

758

00:37:18,700 --> 00:37:13,850

hypothetical situations you could

759

00:37:23,500 --> 00:37:18,710

consider but so what do you imagine I

760

00:37:27,240 --> 00:37:23,510

think I think that given the the

761

00:37:29,610 --> 00:37:27,250

observed accelerations and the

762

00:37:32,050 --> 00:37:29,620

technologies that I imagine you would

763

00:37:34,360 --> 00:37:32,060

need to have to be able to pull

764

00:37:37,630 --> 00:37:34,370

something like that off I can't imagine

765

00:37:41,050 --> 00:37:37,640

that if they wanted to they could be a

766

00:37:44,440 --> 00:37:41,060

threat no what kind of threat I don't I

767

00:37:46,390 --> 00:37:44,450

don't know you know I don't know why

768

00:37:47,770 --> 00:37:46,400

anybody would take over a planet or

769

00:37:49,480 --> 00:37:47,780

something like this like you see in

770

00:37:53,920 --> 00:37:49,490

science fiction I think that's kind of a

771

00:37:58,300 --> 00:37:53,930

silly silly notion but but I think that

772

00:38:00,760 --> 00:37:58,310

if we threatened them then they could

773

00:38:03,520 --> 00:38:00,770

certainly be a threat to us that's

774

00:38:05,860 --> 00:38:03,530

actually why bring this up good yeah but

775

00:38:09,700 --> 00:38:05,870

i but i but I hesitate doing that

776

00:38:11,730 --> 00:38:09,710

because I watched you know I didn't

777

00:38:15,360 --> 00:38:11,740

watch all of the episodes from the the

778

00:38:19,510 --> 00:38:15,370

TTS a documentary unidentified and I

779

00:38:22,480 --> 00:38:19,520

mm-hmm was nervous about that when it

780

00:38:26,530 --> 00:38:22,490

was finished because the overalls theme

781

00:38:31,630 --> 00:38:26,540

seemed to be focused on them being a

782

00:38:35,950 --> 00:38:31,640

threat now on one hand I get that

783

00:38:38,060 --> 00:38:35,960

because the a tip studies were the

784

00:38:41,630 --> 00:38:38,070

Department of Defense that's their job

785

00:38:43,430 --> 00:38:41,640

their job is to assess threats fine and

786

00:38:47,660 --> 00:38:43,440

and they did their job and I think that

787

00:38:50,510 --> 00:38:47,670

that's excellent and so on one hand

788

00:38:52,190 --> 00:38:50,520

that's good on the other hand I think

789

00:38:54,620 --> 00:38:52,200

it's important for people to realize

790

00:38:56,300 --> 00:38:54,630

that military studies or Pentagon or

791

00:38:58,700 --> 00:38:56,310

defense studies are not scientific

792

00:39:00,410 --> 00:38:58,710

studies scientific studies are different

793

00:39:03,440 --> 00:39:00,420

they have different goals they have

794

00:39:08,180 --> 00:39:03,450

different questions they want answered

795

00:39:10,700 --> 00:39:08,190

and so I know a lot of people look to a

796

00:39:12,800 --> 00:39:10,710

tip for information and answers and data

797

00:39:14,330 --> 00:39:12,810

but they're not gonna be able to answer

798

00:39:15,950 --> 00:39:14,340

everything that we want we're going to

799

00:39:19,550 --> 00:39:15,960

want to know that's going to require

800

00:39:22,490 --> 00:39:19,560

scientific study and science science

801
00:39:24,410 --> 00:39:22,500
science works best when people cooperate

802
00:39:26,330 --> 00:39:24,420
and share data and share information and

803
00:39:30,800 --> 00:39:26,340
share ideas that's that's when things

804
00:39:32,270 --> 00:39:30,810
work best and and from the way a lot of

805
00:39:35,000 --> 00:39:32,280
you know a lot of black work is

806
00:39:36,500 --> 00:39:35,010
conducted you end up with scientists

807
00:39:38,390 --> 00:39:36,510
working in pairs where they can only

808
00:39:40,100 --> 00:39:38,400
talk to each other or you know where

809
00:39:43,970 --> 00:39:40,110
some limited group of people and they

810
00:39:45,590 --> 00:39:43,980
can't share information and I don't see

811
00:39:48,020 --> 00:39:45,600
that is always being effective

812
00:39:50,120 --> 00:39:48,030
you know it's effective from a you know

813
00:39:51,500 --> 00:39:50,130

from a secret standpoint where you want

814

00:39:53,960 --> 00:39:51,510

to keep things quiet and you want to

815

00:39:56,450 --> 00:39:53,970

make progress at the same time but at

816

00:39:58,160 --> 00:39:56,460

this point I don't think it's useful to

817

00:40:00,290 --> 00:39:58,170

keep this stuff secret anymore I think

818

00:40:01,850 --> 00:40:00,300

that we all need to know what's going on

819

00:40:03,950 --> 00:40:01,860

and I think we all need to work on this

820

00:40:07,550 --> 00:40:03,960

I think it's potentially a serious

821

00:40:10,850 --> 00:40:07,560

serious issue yeah you know it's hard

822

00:40:14,210 --> 00:40:10,860

being a human and wondering about a

823

00:40:17,870 --> 00:40:14,220

different civilization that isn't and so

824

00:40:22,030 --> 00:40:17,880

my naive mind I kind of in a wide-eyed

825

00:40:25,310 --> 00:40:22,040

manner look at a different type of

826

00:40:28,280 --> 00:40:25,320

civilization and I assume that they

827

00:40:30,740 --> 00:40:28,290

could be I'm just pretending millions of

828

00:40:33,530 --> 00:40:30,750

years ahead in their technology and if

829

00:40:34,970 --> 00:40:33,540

that's the case I wonder what they have

830

00:40:39,680 --> 00:40:34,980

evolved past the point of needing

831

00:40:41,510 --> 00:40:39,690

military and if not why but anyway I

832

00:40:45,400 --> 00:40:41,520

wanted to ask you a question and that is

833

00:40:48,560 --> 00:40:45,410

about radar is radar proof of anything

834

00:40:51,170 --> 00:40:48,570

Kevin regarding an anomalous object in

835

00:40:51,859 --> 00:40:51,180

the sky and if so how can it be used to

836

00:40:53,720 --> 00:40:51,869

prove any

837

00:40:57,559 --> 00:40:53,730

and then we'll go into what proof is

838

00:41:01,400 --> 00:40:57,569

later regarding science a piece of

839

00:41:05,960 --> 00:41:01,410

evidence it doesn't constitute proof by

840

00:41:08,779 --> 00:41:05,970

itself - really you know what you really

841

00:41:12,079 --> 00:41:08,789

want in these situations as you want

842

00:41:16,539 --> 00:41:12,089

multiple imaging modalities that that

843

00:41:21,019 --> 00:41:16,549

I'll concur and so when you have

844

00:41:22,460 --> 00:41:21,029

somebody like senior chief day somebody

845

00:41:26,329 --> 00:41:22,470

like senior chief day picking these

846

00:41:28,880 --> 00:41:26,339

things up on radar and then instructing

847

00:41:31,220 --> 00:41:28,890

you know commander favor to go to this

848

00:41:32,900 --> 00:41:31,230

location and see what this is and flavor

849

00:41:35,569 --> 00:41:32,910

gets there and actually sees an object

850

00:41:40,009 --> 00:41:35,579

that's anomalous then these things

851
00:41:42,559 --> 00:41:40,019
concur you know so and you know or order

852
00:41:44,749 --> 00:41:42,569
the subsequent flight that went with the

853
00:41:46,910 --> 00:41:44,759
atmosphere with the infrared imaging and

854
00:41:49,670 --> 00:41:46,920
actually captured infrared images of the

855
00:41:54,259 --> 00:41:49,680
object and while it's true that you know

856
00:41:56,059 --> 00:41:54,269
as some of the more publicly prominent

857
00:41:57,859 --> 00:41:56,069
scientists have noted you know when

858
00:41:59,509 --> 00:41:57,869
discussing the Adler videos you know

859
00:42:00,859 --> 00:41:59,519
they basically throw their arms up and

860
00:42:02,180 --> 00:42:00,869
say well it could it be anything it's a

861
00:42:04,039 --> 00:42:02,190
blurry image well of course it's a

862
00:42:05,239 --> 00:42:04,049
blurry image it's an infrared image you

863
00:42:07,910 --> 00:42:05,249

know what do you expect it to be of

864

00:42:10,819 --> 00:42:07,920

course it's gonna be blurry but it can't

865

00:42:13,539 --> 00:42:10,829

be anything that's that's the the issue

866

00:42:15,799 --> 00:42:13,549

I mean I think you know my my favorite

867

00:42:17,390 --> 00:42:15,809

explanation that I had somebody throw at

868

00:42:23,960 --> 00:42:17,400

me was maybe it's a highly reflective

869

00:42:25,910 --> 00:42:23,970

bird I've been a bird watcher since I

870

00:42:27,970 --> 00:42:25,920

was five years old so for me this is

871

00:42:33,200 --> 00:42:27,980

really a stupid thing to say

872

00:42:35,839 --> 00:42:33,210

Mach three yeah exactly well actually

873

00:42:38,599 --> 00:42:35,849

actually yeah faster than that I think

874

00:42:40,880 --> 00:42:38,609

the the top speeds you were looking at

875

00:42:42,789 --> 00:42:40,890

are you know it's looking at Mach 16 or

876

00:42:45,229 --> 00:42:42,799

something like this in some cases so

877

00:42:47,180 --> 00:42:45,239

it's that's ridiculous saying it saying

878

00:42:49,430 --> 00:42:47,190

it could be anything is ridiculous no it

879

00:42:52,309 --> 00:42:49,440

can't be anything it is something

880

00:42:55,099 --> 00:42:52,319

special though it's it what it can't be

881

00:42:57,470 --> 00:42:55,109

as it can't be an f-18 and it can't be

882

00:43:00,259 --> 00:42:57,480

an make so and it's not a missile so

883

00:43:03,379 --> 00:43:00,269

that's of interest

884

00:43:04,999 --> 00:43:03,389

okay I do have a question that I am so

885

00:43:07,579 --> 00:43:05,009

glad I thought of I didn't want to

886

00:43:10,309 --> 00:43:07,589

forget this and I want to know how do

887

00:43:13,339 --> 00:43:10,319

you translate this into a scientific

888

00:43:14,779 --> 00:43:13,349

observation and that is this when we

889

00:43:18,169 --> 00:43:14,789

were talking to the gentleman from the

890

00:43:21,409 --> 00:43:18,179

USS Nimitz in the USS Princeton a few of

891

00:43:24,009 --> 00:43:21,419

them mentioned how there were some

892

00:43:26,839 --> 00:43:24,019

people that came on to their ship and

893

00:43:29,779 --> 00:43:26,849

coveted that information meaning the

894

00:43:33,709 --> 00:43:29,789

anomalous object that they all witnessed

895

00:43:37,489 --> 00:43:33,719

and the recorded imagery of it now my

896

00:43:42,039 --> 00:43:37,499

question to you is since you're so

897

00:43:45,469 --> 00:43:42,049

deeply involved in this topic from the

898

00:43:49,339 --> 00:43:45,479

the side of science how do you then

899

00:43:52,489 --> 00:43:49,349

insert that behavior into your science

900

00:43:54,199 --> 00:43:52,499

paper if you were to cite it because you

901
00:43:58,759 --> 00:43:54,209
know you're talking about humans and

902
00:44:01,699 --> 00:43:58,769
their reactions but still it's important

903
00:44:04,969 --> 00:44:01,709
that there are people coming on board

904
00:44:07,149 --> 00:44:04,979
these ships to grab that data does it

905
00:44:10,359 --> 00:44:07,159
matter to science what they did because

906
00:44:13,489 --> 00:44:10,369
you know if that's one of our own

907
00:44:15,319 --> 00:44:13,499
objects that were command deering why

908
00:44:20,659 --> 00:44:15,329
would we then have our own go grab that

909
00:44:23,419 --> 00:44:20,669
imagery well yeah so now we're now we

910
00:44:25,369 --> 00:44:23,429
have to hypothesize what the intent of

911
00:44:27,289 --> 00:44:25,379
those people were and what their

912
00:44:30,529 --> 00:44:27,299
motivations were and that becomes

913
00:44:33,109 --> 00:44:30,539

challenging the the what's surprising to

914

00:44:35,869 --> 00:44:33,119

me is the fact that they knew that those

915

00:44:37,459 --> 00:44:35,879

encounters took place and from the

916

00:44:40,179 --> 00:44:37,469

people from the Nimitz that I've talked

917

00:44:45,499 --> 00:44:40,189

to that is also surprising to them so

918

00:44:49,059 --> 00:44:45,509

that would lead me to believe that there

919

00:44:51,259 --> 00:44:49,069

is then a higher probability that that

920

00:44:54,019 --> 00:44:51,269

whoever these people were knew about

921

00:44:56,329 --> 00:44:54,029

these objects beforehand possibly

922

00:44:58,639 --> 00:44:56,339

because they were their objects and and

923

00:45:04,729 --> 00:44:58,649

that belonged to them or their program

924

00:45:06,979 --> 00:45:04,739

no I would worry that you know if you

925

00:45:10,879 --> 00:45:06,989

have another military program going on

926
00:45:13,129 --> 00:45:10,889
and you've got craft flying around that

927
00:45:13,790 --> 00:45:13,139
are basically interfering with training

928
00:45:17,060 --> 00:45:13,800
program

929
00:45:18,980 --> 00:45:17,070
in the Navy or interfering with Navy

930
00:45:21,920 --> 00:45:18,990
pilots you know buzzing past their

931
00:45:23,510 --> 00:45:21,930
planes and putting them in danger that

932
00:45:26,120 --> 00:45:23,520
doesn't sound very legal to me I'm not

933
00:45:28,970 --> 00:45:26,130
an expert in legality of these issues

934
00:45:32,270 --> 00:45:28,980
but that sounds dangerous and foolish in

935
00:45:34,850 --> 00:45:32,280
many respects so well that's why yes and

936
00:45:36,890 --> 00:45:34,860
I I do know that there are real strict

937
00:45:38,840 --> 00:45:36,900
limits in terms of let's say yeah

938
00:45:44,000 --> 00:45:38,850

breaking the sound barrier for example

939

00:45:45,650 --> 00:45:44,010

for any of those military craft right in

940

00:45:47,360 --> 00:45:45,660

all these cases in all the cases I

941

00:45:49,310 --> 00:45:47,370

looked at these the airplanes were

942

00:45:54,170 --> 00:45:49,320

approached in close proximity by these

943

00:45:57,200 --> 00:45:54,180

objects and and that's that's a safety

944

00:46:00,200 --> 00:45:57,210

issue that's Richard Haines who was also

945

00:46:03,140 --> 00:46:00,210

formerly from NASA Ames had set up my

946

00:46:06,260 --> 00:46:03,150

cap which is reporting anonymous

947

00:46:08,330 --> 00:46:06,270

reporting agency for pilots because he

948

00:46:10,190 --> 00:46:08,340

was concerned about about aviation

949

00:46:13,430 --> 00:46:10,200

safety issues and these this is an

950

00:46:16,670 --> 00:46:13,440

aviation safety issue and so I I find it

951
00:46:18,740 --> 00:46:16,680
frustrating when I do encounter

952
00:46:21,170 --> 00:46:18,750
scientists and others who blow this off

953
00:46:23,330 --> 00:46:21,180
or try to blow this off and say it could

954
00:46:25,190 --> 00:46:23,340
be anything well we need to look into it

955
00:46:26,990 --> 00:46:25,200
because this is an aviation problem

956
00:46:29,570 --> 00:46:27,000
you're gonna end up with a downed pilot

957
00:46:32,870 --> 00:46:29,580
you know or you got you got passenger

958
00:46:34,910 --> 00:46:32,880
jet pilots seeing these things I don't

959
00:46:37,100 --> 00:46:34,920
want to be in a plane flying you know

960
00:46:40,040 --> 00:46:37,110
from New York to San Francisco and have

961
00:46:42,440 --> 00:46:40,050
my pilot have to evade you know evade

962
00:46:44,060 --> 00:46:42,450
some approaching unknown aircraft I

963
00:46:45,230 --> 00:46:44,070

don't want to have to know I mean I'm

964

00:46:46,790 --> 00:46:45,240

not gonna know about it because they

965

00:46:48,710 --> 00:46:46,800

keep it quiet but I don't need my I

966

00:46:52,130 --> 00:46:48,720

don't need my pilot on edge because that

967

00:46:53,990 --> 00:46:52,140

happened these are things that should be

968

00:46:55,520 --> 00:46:54,000

worried about and Congress Congress

969

00:46:58,190 --> 00:46:55,530

should get involved this is really why

970

00:47:00,440 --> 00:46:58,200

Congress should be involved right and so

971

00:47:03,710 --> 00:47:00,450

I don't mean to be a professor yeah let

972

00:47:05,450 --> 00:47:03,720

me jump in here real quick yeah and you

973

00:47:07,940 --> 00:47:05,460

had mentioned Congress being involved it

974

00:47:09,590 --> 00:47:07,950

seems like the Congress people who are

975

00:47:13,160 --> 00:47:09,600

interested in are getting briefed on

976
00:47:15,620 --> 00:47:13,170
this issue are folks that are members of

977
00:47:18,140 --> 00:47:15,630
various military related committees and

978
00:47:21,130 --> 00:47:18,150
not the science are you a little

979
00:47:23,360 --> 00:47:21,140
disappointed that it the the scientific

980
00:47:25,660 --> 00:47:23,370
committees are not taking a closer look

981
00:47:28,750 --> 00:47:25,670
at this

982
00:47:32,289 --> 00:47:28,760
yes and now I think I mean I understand

983
00:47:34,299 --> 00:47:32,299
it I think that the the belief that the

984
00:47:37,059 --> 00:47:34,309
first concern is that these rings are

985
00:47:39,579 --> 00:47:37,069
Russian or Chinese or you know from some

986
00:47:41,260 --> 00:47:39,589
other nation and that I think is

987
00:47:44,079 --> 00:47:41,270
probably their first concern and that's

988
00:47:48,880 --> 00:47:44,089

probably the reasonable question to ask

989

00:47:50,380 --> 00:47:48,890

first once that gets resolved and if we

990

00:47:54,250 --> 00:47:50,390

find out they're not Russian or Chinese

991

00:47:56,020 --> 00:47:54,260

or any but anybody else then then the

992

00:47:58,440 --> 00:47:56,030

question comes you know who do they

993

00:48:07,299 --> 00:48:04,500

you know we'll have to get involved I

994

00:48:09,970 --> 00:48:07,309

would I would like it if scientists had

995

00:48:11,230 --> 00:48:09,980

been involved from the beginning you

996

00:48:13,690 --> 00:48:11,240

know basically from when the SETI

997

00:48:15,400 --> 00:48:13,700

project started you know the these

998

00:48:17,980 --> 00:48:15,410

things should have been looked at along

999

00:48:19,990 --> 00:48:17,990

with looking for radio waves radio

1000

00:48:22,599 --> 00:48:20,000

signals from from other worlds I mean

1001

00:48:24,010 --> 00:48:22,609

you if you have aliens here that's

1002

00:48:33,430 --> 00:48:24,020

definitely something you want to know

1003

00:48:36,099 --> 00:48:33,440

about you know look into it seriously

1004

00:48:38,079 --> 00:48:36,109

assess it and then go from there so

1005

00:48:40,450 --> 00:48:38,089

Kevin I want to nickel you about

1006

00:48:42,819 --> 00:48:40,460

something and kind of like see if you'll

1007

00:48:46,450 --> 00:48:42,829

allow me to be redundant with you and

1008

00:48:50,309 --> 00:48:46,460

that is I want to know do you feel how

1009

00:48:55,410 --> 00:48:50,319

do you feel about the possibility of

1010

00:48:58,210 --> 00:48:55,420

this tick pack being one of ours and

1011

00:49:00,789 --> 00:48:58,220

invading our own airspace so to speak in

1012

00:49:02,829 --> 00:49:00,799

a manner that would put people in

1013

00:49:04,240 --> 00:49:02,839

jeopardy that would be illegal

1014

00:49:07,109 --> 00:49:04,250

does that sound like something we would

1015

00:49:10,240 --> 00:49:07,119

do I mean that that just sounds odd I

1016

00:49:12,460 --> 00:49:10,250

mean why would we do that I'm not

1017

00:49:15,940 --> 00:49:12,470

expecting you answer that and then also

1018

00:49:18,490 --> 00:49:15,950

wouldn't it also lend a bit more more to

1019

00:49:22,020 --> 00:49:18,500

a possibility that it could be not one

1020

00:49:27,609 --> 00:49:22,030

of ours so to speak but something else

1021

00:49:31,059 --> 00:49:27,619

really hypothesize about the motives or

1022

00:49:33,220 --> 00:49:31,069

actions of in people or groups that are

1023

00:49:35,530 --> 00:49:33,230

government I mean I can just say

1024

00:49:37,870 --> 00:49:35,540

Tuskegee Experiment and we're done with

1025

00:49:40,490 --> 00:49:37,880

that conversation so yes

1026

00:49:43,970 --> 00:49:40,500

hybl do do those things and that does

1027

00:49:45,710 --> 00:49:43,980

happen so it's it's a possibility well

1028

00:49:48,500 --> 00:49:45,720

thank you very much I wanted to talk

1029

00:49:50,180 --> 00:49:48,510

about the conclusion of your paper and

1030

00:49:51,590 --> 00:49:50,190

the paper being estimating flight

1031

00:49:54,560 --> 00:49:51,600

characteristics of anomalous

1032

00:49:57,050 --> 00:49:54,570

unidentified aerial vehicles now I just

1033

00:49:59,060 --> 00:49:57,060

wanted to read a sentence or two from

1034

00:50:01,400 --> 00:49:59,070

your conclusion in fact is it okay if I

1035

00:50:06,080 --> 00:50:01,410

just read a good part of it is that all

1036

00:50:08,870 --> 00:50:06,090

right thank you very much I appreciate

1037

00:50:11,000 --> 00:50:08,880

that regarding your conclusion it says

1038

00:50:12,860 --> 00:50:11,010

it is difficult to draw any useful

1039

00:50:14,630 --> 00:50:12,870

conclusions at this point we have

1040

00:50:16,700 --> 00:50:14,640

characterized the accelerations of a

1041

00:50:19,250 --> 00:50:16,710

number of UAVs and have demonstrated

1042

00:50:21,350 --> 00:50:19,260

that if they are craft then they're

1043

00:50:23,300 --> 00:50:21,360

indeed anomalous displaying technical

1044

00:50:26,030 --> 00:50:23,310

capabilities far exceeding those of our

1045

00:50:27,290 --> 00:50:26,040

fastest craft and spacecraft it is not

1046

00:50:29,540 --> 00:50:27,300

clear that these objects are

1047

00:50:31,340 --> 00:50:29,550

extraterrestrial in origin but it is

1048

00:50:33,380 --> 00:50:31,350

extremely difficult to imagine that

1049

00:50:35,840 --> 00:50:33,390

anyone on earth with such technology

1050

00:50:38,000 --> 00:50:35,850

would not put it to use moreover

1051
00:50:40,430 --> 00:50:38,010
observations of similar you AP's goes

1052
00:50:42,860 --> 00:50:40,440
back to well before the error of flight

1053
00:50:44,960 --> 00:50:42,870
collectively these observations strongly

1054
00:50:46,580 --> 00:50:44,970
suggest that these UAVs should be

1055
00:50:48,410 --> 00:50:46,590
carefully studied by scientists

1056
00:50:52,210 --> 00:50:48,420
unfortunately the attitude that the

1057
00:50:54,680 --> 00:50:52,220
studies of UAVs UFOs is unscientific

1058
00:50:56,480 --> 00:50:54,690
pervades the scientific community

1059
00:50:59,030 --> 00:50:56,490
including SETI search for

1060
00:51:01,280 --> 00:50:59,040
extraterrestrial intelligence which is

1061
00:51:02,570 --> 00:51:01,290
surprising especially since efforts are

1062
00:51:05,150 --> 00:51:02,580
underway to search for extraterrestrial

1063
00:51:08,150 --> 00:51:05,160

artifacts in the solar system on the

1064

00:51:10,940 --> 00:51:08,160

moon Mars and asteroids and at Earth

1065

00:51:13,490 --> 00:51:10,950

associated Lagrange points ironically

1066

00:51:15,950 --> 00:51:13,500

such attitudes inhibit scientific study

1067

00:51:18,170 --> 00:51:15,960

perpetuating a state of ignorance about

1068

00:51:20,150 --> 00:51:18,180

these phenomena that has persisted for

1069

00:51:22,610 --> 00:51:20,160

well over seventy years and is now

1070

00:51:25,400 --> 00:51:22,620

detrimental since answers are presently

1071

00:51:27,410 --> 00:51:25,410

needed what a really impactful powerful

1072

00:51:28,880 --> 00:51:27,420

thing that you said there Kevin can you

1073

00:51:37,130 --> 00:51:28,890

please tell us a little bit more about

1074

00:51:39,560 --> 00:51:37,140

that conclusion that you did I have to

1075

00:51:42,560 --> 00:51:39,570

say I wrote that a couple weeks ago and

1076

00:51:44,330 --> 00:51:42,570

I have I keep going over the paper

1077

00:51:47,420 --> 00:51:44,340

because I'm still making a few edits to

1078

00:51:49,310 --> 00:51:47,430

it and and I still really really like

1079

00:51:50,890 --> 00:51:49,320

that conclusion I think it hits all the

1080

00:51:53,140 --> 00:51:50,900

points that I wanted

1081

00:51:54,940 --> 00:51:53,150

yeah it hit home really well thank you

1082

00:51:57,760 --> 00:51:54,950

so much for having allowed me to read

1083

00:51:59,530 --> 00:51:57,770

that and this paper a kind of funny

1084

00:52:07,510 --> 00:51:59,540

question how long did it take you to

1085

00:52:09,310 --> 00:52:07,520

write it oh my gosh if you include if

1086

00:52:12,880 --> 00:52:09,320

you include doing the analysis of the

1087

00:52:17,470 --> 00:52:12,890

data probably I've been working on it

1088

00:52:21,250 --> 00:52:17,480

since since March or so so I guess it's

1089

00:52:23,980 --> 00:52:21,260

been about four months or something like

1090

00:52:24,640 --> 00:52:23,990

that four or five months now I notice

1091

00:52:26,830 --> 00:52:24,650

that she brought up the

1092

00:52:29,650 --> 00:52:26,840

extra-terrestrial hypothesis that would

1093

00:52:32,530 --> 00:52:29,660

be shocks of Valley's hypothesis why did

1094

00:52:34,300 --> 00:52:32,540

you do that because it's a question that

1095

00:52:36,040 --> 00:52:34,310

is going to come up when reading a paper

1096

00:52:41,290 --> 00:52:36,050

like this so I thought I should at least

1097

00:52:44,200 --> 00:52:41,300

address it and I basically basically say

1098

00:52:45,820 --> 00:52:44,210

what I had said earlier that proving

1099

00:52:53,560 --> 00:52:45,830

that something is extraterrestrial is

1100

00:52:55,780 --> 00:52:53,570

extremely difficult even even this even

1101
00:52:59,170 --> 00:52:55,790
this data here you know the goal the

1102
00:53:01,840 --> 00:52:59,180
goal of this paper is to start building

1103
00:53:04,390 --> 00:53:01,850
a body of scientific evidence and you

1104
00:53:06,130 --> 00:53:04,400
know so that we can come to some real

1105
00:53:11,920 --> 00:53:06,140
understanding of what these things are

1106
00:53:13,960 --> 00:53:11,930
and and and do something about the state

1107
00:53:16,150 --> 00:53:13,970
of ignorance that is persisted for over

1108
00:53:18,220 --> 00:53:16,160
seven years I think that's I think

1109
00:53:21,010 --> 00:53:18,230
having being this ignorant about

1110
00:53:24,010 --> 00:53:21,020
something that is now clearly this

1111
00:53:25,800 --> 00:53:24,020
important you know shows some level of

1112
00:53:29,470 --> 00:53:25,810
irresponsibility on the part of

1113
00:53:31,930 --> 00:53:29,480

scientists and lawmakers well go ahead

1114

00:53:34,780 --> 00:53:31,940

Frank yeah I just wanted to ask you'd

1115

00:53:37,420 --> 00:53:34,790

said that you are working to model

1116

00:53:39,220 --> 00:53:37,430

dramatic relativistic travelers which

1117

00:53:41,430 --> 00:53:39,230

I'm assuming is going to mean just

1118

00:53:43,600 --> 00:53:41,440

basically interstellar travelers and

1119

00:53:45,580 --> 00:53:43,610

eventually have a research paper on that

1120

00:53:47,080 --> 00:53:45,590

topic and your goal is to model

1121

00:53:49,270 --> 00:53:47,090

different societies with different

1122

00:53:52,109 --> 00:53:49,280

characteristics so I can you tell us a

1123

00:53:55,439 --> 00:53:52,119

little bit about that yeah

1124

00:54:00,120 --> 00:53:55,449

that was a that was based on a talk that

1125

00:54:08,339 --> 00:54:00,130

I gave at SCU in March at the SU meeting

1126

00:54:09,929 --> 00:54:08,349

in March and one of the the the

1127

00:54:12,420 --> 00:54:09,939

difficult there's there several

1128

00:54:14,459 --> 00:54:12,430

difficult aspects here when it comes to

1129

00:54:17,130 --> 00:54:14,469

talking about what we expect

1130

00:54:18,599 --> 00:54:17,140

extraterrestrials to be able to do or

1131

00:54:20,839 --> 00:54:18,609

accomplish when it comes to interest

1132

00:54:25,799 --> 00:54:20,849

teller travel and one of those is that

1133

00:54:29,459 --> 00:54:25,809

we are very heavily biased by science

1134

00:54:32,009 --> 00:54:29,469

fiction and one of the issues in science

1135

00:54:34,469 --> 00:54:32,019

fiction is you want to have a story

1136

00:54:36,329 --> 00:54:34,479

involving people flying from planet to

1137

00:54:38,910 --> 00:54:36,339

planet or star system to star system

1138

00:54:40,650 --> 00:54:38,920

they have to go fly off and beat Darth

1139

00:54:41,939 --> 00:54:40,660

Vader or the Daleks and then they have

1140

00:54:44,759 --> 00:54:41,949

to be able to make it home for dinner

1141

00:54:47,519 --> 00:54:44,769

you know to have a good story so so this

1142

00:54:54,660 --> 00:54:47,529

really requires something like faster

1143

00:54:57,839 --> 00:54:54,670

than light travel and so the assumption

1144

00:54:59,819 --> 00:54:57,849

has become that you really need to have

1145

00:55:04,229 --> 00:54:59,829

faster than light travel to be able to

1146

00:55:05,579 --> 00:55:04,239

travel interstellar distances so the

1147

00:55:08,939 --> 00:55:05,589

fact is that's not actually true

1148

00:55:10,559 --> 00:55:08,949

you can travel slower than the speed of

1149

00:55:15,689 --> 00:55:10,569

light and still travel at interstellar

1150

00:55:18,179 --> 00:55:15,699

distances the and even the the fact is

1151

00:55:21,839 --> 00:55:18,189

that relativity works in your favor the

1152

00:55:24,329 --> 00:55:21,849

faster you go the slower the time

1153

00:55:29,039 --> 00:55:24,339

advances on your spacecraft compared to

1154

00:55:31,049 --> 00:55:29,049

the rest of the galaxy and and so you

1155

00:55:32,849 --> 00:55:31,059

can traverse these distances and

1156

00:55:34,529 --> 00:55:32,859

reasonable periods of time that's the

1157

00:55:36,179 --> 00:55:34,539

traveler can traverse these distances

1158

00:55:38,819 --> 00:55:36,189

and reasonable periods of time whereas

1159

00:55:41,039 --> 00:55:38,829

the people at home this is going to take

1160

00:55:43,679 --> 00:55:41,049

hundreds of years you know to power you

1161

00:55:46,410 --> 00:55:43,689

know many years depending on the

1162

00:55:51,449 --> 00:55:46,420

distances that are traveled so for

1163

00:55:53,459 --> 00:55:51,459

example in the in the paper that I the

1164

00:55:56,400 --> 00:55:53,469

MaxEnt paper I actually put up an

1165

00:55:59,549 --> 00:55:56,410

example here where I show what happens

1166

00:56:01,229 --> 00:55:59,559

if you accelerated a thousand G's which

1167

00:56:04,660 --> 00:56:01,239

is still less than what was observed by

1168

00:56:06,460 --> 00:56:04,670

by senior chief day

1169

00:56:09,759 --> 00:56:06,470

but if you have a ship that can

1170

00:56:11,529 --> 00:56:09,769

accelerate it a thousand Gees halfway

1171

00:56:15,009 --> 00:56:11,539

and then you decelerate at a thousand

1172

00:56:17,400 --> 00:56:15,019

Gees the other half you can literally

1173

00:56:20,470 --> 00:56:17,410

get to Alpha Centauri in about five days

1174

00:56:23,099 --> 00:56:20,480

now that's five days travel travel time

1175

00:56:25,450 --> 00:56:23,109

for the for the person in the spacecraft

1176

00:56:29,049 --> 00:56:25,460

for everybody else on earth it'll be

1177

00:56:32,210 --> 00:56:29,059

just over four years which is why yeah

1178

00:56:38,370 --> 00:56:32,220

you lean towards the nomadic the nomadic

1179

00:56:42,930 --> 00:56:41,259

at a hundred G acceleration which is

1180

00:56:46,089 --> 00:56:42,940

which is on the low end of what we've

1181

00:56:49,269 --> 00:56:46,099

observed in these cases you can actually

1182

00:56:52,690 --> 00:56:49,279

get across the galaxy in about a hundred

1183

00:56:54,309 --> 00:56:52,700

and twenty days travel time so that's so

1184

00:56:56,650 --> 00:56:54,319

you're talking you're talking four

1185

00:56:59,200 --> 00:56:56,660

months which is faster than we get to

1186

00:57:01,269 --> 00:56:59,210

Mars now so one of these craft

1187

00:57:03,250 --> 00:57:01,279

accelerating 100 G halfway across the

1188

00:57:05,559 --> 00:57:03,260

galaxy and then decelerating our energy

1189

00:57:07,210 --> 00:57:05,569

they can they're going to get up to very

1190

00:57:08,470 --> 00:57:07,220

high percentages of the speed of light

1191

00:57:09,999 --> 00:57:08,480

they're not going to go faster than the

1192

00:57:11,799 --> 00:57:10,009

speed of light but they'll be going fast

1193

00:57:14,349 --> 00:57:11,809

enough that relativity is really kicked

1194

00:57:18,759 --> 00:57:14,359

in and they can actually make it across

1195

00:57:23,470 --> 00:57:18,769

the galaxy in a couple months now for

1196

00:57:24,870 --> 00:57:23,480

the us back home we're gonna say they go

1197

00:57:27,039 --> 00:57:24,880

to the other side of the galaxy

1198

00:57:29,410 --> 00:57:27,049

some eighty thousand light years away

1199

00:57:32,380 --> 00:57:29,420

and then they come back to earth you

1200

00:57:35,259 --> 00:57:32,390

know so for them it's a basically eight

1201

00:57:37,029 --> 00:57:35,269

eight or nine months later for us at

1202

00:57:40,089 --> 00:57:37,039

home it's gonna be a hundred sixty

1203

00:57:43,029 --> 00:57:40,099

thousand years later and you know this

1204

00:57:45,509 --> 00:57:43,039

is you know most scientists know that

1205

00:57:49,269 --> 00:57:45,519

this is how it would work but the

1206

00:57:52,329 --> 00:57:49,279

general belief has been who would do

1207

00:57:53,890 --> 00:57:52,339

this why would you bother because nobody

1208

00:57:56,140 --> 00:57:53,900

on earth is gonna get to find out what

1209

00:58:00,009 --> 00:57:56,150

you learned because you won't be back

1210

00:58:01,329 --> 00:58:00,019

460 thousand years and and you know one

1211

00:58:04,990 --> 00:58:01,339

day when thinking about it I thought

1212

00:58:06,519 --> 00:58:05,000

well you people would do this people

1213

00:58:09,059 --> 00:58:06,529

people are right now signing up for a

1214

00:58:14,109 --> 00:58:09,069

one-way trip to Mars with you know

1215

00:58:15,940 --> 00:58:14,119

people are crazy I wouldn't do it

1216

00:58:17,810 --> 00:58:15,950

personally but I'm sure I could find

1217

00:58:20,870 --> 00:58:17,820

people who would do it

1218

00:58:23,390 --> 00:58:20,880

so but then you could make it work if

1219

00:58:25,190 --> 00:58:23,400

you all went in different directions and

1220

00:58:27,320 --> 00:58:25,200

you explored the galaxy and you just met

1221

00:58:28,609 --> 00:58:27,330

back here in eight months you know

1222

00:58:30,050 --> 00:58:28,619

they'd be meeting back here in eight

1223

00:58:31,790 --> 00:58:30,060

months their time but it would be a

1224

00:58:34,400 --> 00:58:31,800

hundred sixty thousand years from now

1225

00:58:36,470 --> 00:58:34,410

but but so you would have to give up

1226

00:58:38,450 --> 00:58:36,480

your idea of a home world you don't live

1227

00:58:40,330 --> 00:58:38,460

on a planet anywhere you just travel and

1228

00:58:43,670 --> 00:58:40,340

if you travel all the time you could be

1229

00:58:46,940 --> 00:58:43,680

you could form a nomadic spacefaring

1230

00:58:49,930 --> 00:58:46,950

civilization and pneumatic civilizations

1231

00:58:52,700 --> 00:58:49,940

are rare now on earth but they they are

1232

00:58:54,530 --> 00:58:52,710

they're not non-existent we do have

1233

00:58:56,210 --> 00:58:54,540

pneumatic civilizations still on earth

1234

00:58:59,740 --> 00:58:56,220

and they were more common in the past

1235

00:59:03,140 --> 00:58:59,750

you know so it's it's very reasonable

1236

00:59:04,670 --> 00:59:03,150

Riis very reasonable idea so so what I

1237

00:59:08,120 --> 00:59:04,680

what I intended to do for that project

1238

00:59:10,130 --> 00:59:08,130

was to basically model interstellar

1239

00:59:11,810 --> 00:59:10,140

travelers a whole network of interest

1240

00:59:13,270 --> 00:59:11,820

teller travelers that basically travel

1241

00:59:18,440 --> 00:59:13,280

with me know and travel and meet up and

1242

00:59:21,380 --> 00:59:18,450

to see if there's a way to arrange meet

1243

00:59:23,540 --> 00:59:21,390

up times and meet up points kind of in

1244

00:59:27,109 --> 00:59:23,550

an organic or natural manner so that you

1245

00:59:28,760 --> 00:59:27,119

don't have to pre-plan things and to see

1246

00:59:32,570 --> 00:59:28,770

if there's a way to design a network

1247

00:59:34,790 --> 00:59:32,580

this way and so I've my initial

1248

00:59:37,640 --> 00:59:34,800

experiments yes you can do it it does

1249

00:59:39,740 --> 00:59:37,650

seem to work and you know it's very

1250

00:59:45,020 --> 00:59:39,750

possible that somebody may have tried

1251

00:59:46,640 --> 00:59:45,030

this and they do this and so so a

1252

00:59:50,089 --> 00:59:46,650

society like this would be really

1253

00:59:51,829 --> 00:59:50,099

interesting because their concept of

1254

00:59:54,140 --> 00:59:51,839

biology would be very different than

1255

00:59:56,210 --> 00:59:54,150

ours they would they would study biology

1256

00:59:58,730 --> 00:59:56,220

on an evolutionary scale you could

1257

01:00:00,140 --> 00:59:58,740

literally fly back and forth from one

1258

01:00:01,820 --> 01:00:00,150

side of the galaxy the other and keep

1259

01:00:03,410 --> 01:00:01,830

coming back to earth and you'd revisit

1260

01:00:06,530 --> 01:00:03,420

it every one hundred sixty thousand

1261

01:00:09,260 --> 01:00:06,540

years so with you know with less than

1262

01:00:11,089 --> 01:00:09,270

one year of your lifetime so so when

1263

01:00:12,680 --> 01:00:11,099

you're you know if you live for 50 years

1264

01:00:14,359 --> 01:00:12,690

and you did this you could you could

1265

01:00:15,800 --> 01:00:14,369

experience about 12 million years of

1266

01:00:17,049 --> 01:00:15,810

evolution on earth which would be

1267

01:00:22,569 --> 01:00:17,059

fascinating

1268

01:00:24,669 --> 01:00:22,579

I do have some questions from some of

1269

01:00:26,439 --> 01:00:24,679

our listeners here let me go ahead and

1270

01:00:29,529 --> 01:00:26,449

pull them up it'll just take about ten

1271

01:00:33,339 --> 01:00:29,539

seconds one night okay it looks like I

1272

01:00:38,679 --> 01:00:33,349

have a question from a listener who said

1273

01:00:41,859 --> 01:00:38,689

why do et's need crafts at all just

1274

01:00:55,029 --> 01:00:41,869

supposing that there are ETS why would

1275

01:00:56,739 --> 01:00:55,039

they need crafts at all Kevin and do you

1276

01:00:59,459 --> 01:00:56,749

feel it's possible they could be

1277

01:01:02,199 --> 01:00:59,469

altering the future is another question

1278

01:01:04,809 --> 01:01:02,209

we alter the future I mean that's what

1279

01:01:07,209 --> 01:01:04,819

the future is so I don't know exactly

1280

01:01:09,699 --> 01:01:07,219

where they would question who would be

1281

01:01:11,979 --> 01:01:09,709

going with that right thank you so much

1282

01:01:15,429 --> 01:01:11,989

for having answered that and then I also

1283

01:01:18,069 --> 01:01:15,439

wanted to bring up you talked about

1284

01:01:19,719 --> 01:01:18,079

relativity the general theory of

1285

01:01:21,249 --> 01:01:19,729

relativity and when it would kick in can

1286

01:01:23,380 --> 01:01:21,259

you go over that concept a little bit

1287

01:01:28,799 --> 01:01:23,390

more regarding interstellar travel

1288

01:01:32,169 --> 01:01:28,809

please right so the the idea is that

1289

01:01:35,909 --> 01:01:32,179

time and lengths are observer based it

1290

01:01:38,769 --> 01:01:35,919

depends on who's looking at them so if

1291

01:01:40,599 --> 01:01:38,779

you take a meter stick with a clock on

1292

01:01:42,069 --> 01:01:40,609

it and you shoot that meter stick with a

1293

01:01:44,469 --> 01:01:42,079

clock past me it's very close to the

1294

01:01:46,059 --> 01:01:44,479

speed of light I'm going to measure the

1295

01:01:47,859 --> 01:01:46,069

length of that meter stick as being very

1296

01:01:50,319 --> 01:01:47,869

short it's gonna actually shrink in

1297

01:01:53,679 --> 01:01:50,329

length and the clock will move much more

1298

01:01:55,599 --> 01:01:53,689

slowly now conversely if you're writing

1299

01:01:57,099 --> 01:01:55,609

on that meter stick and I'm holding and

1300

01:01:58,449 --> 01:01:57,109

you look at me who's holding your clock

1301

01:02:00,309 --> 01:01:58,459

in a meter stick you'll see that my

1302

01:02:04,449 --> 01:02:00,319

meter stick is shortened and my clock is

1303

01:02:05,859 --> 01:02:04,459

going more slowly so when it comes to

1304

01:02:07,359 --> 01:02:05,869

interstellar travel you have two

1305

01:02:09,009 --> 01:02:07,369

different perspectives you can consider

1306

01:02:11,349 --> 01:02:09,019

you can consider the perspective of the

1307

01:02:12,789 --> 01:02:11,359

traveller or you can consider the

1308

01:02:16,569 --> 01:02:12,799

perspective of the people staying at

1309

01:02:18,039 --> 01:02:16,579

home on earth or wherever from the

1310

01:02:20,169 --> 01:02:18,049

perspective of people on earth

1311

01:02:22,479 --> 01:02:20,179

you know I fly off to Alpha Centauri at

1312

01:02:25,959 --> 01:02:22,489

90% the speed of light they're going to

1313

01:02:28,029 --> 01:02:25,969

see my clock moving very slowly so of

1314

01:02:30,219 --> 01:02:28,039

course I make it there in a short period

1315

01:02:31,000 --> 01:02:30,229

of time by my clock so it doesn't seem

1316

01:02:32,320 --> 01:02:31,010

very

1317

01:02:35,220 --> 01:02:32,330

so the traveler can make it there

1318

01:02:37,630 --> 01:02:35,230

because their time is going more slowly

1319

01:02:39,730 --> 01:02:37,640

from the perspective the traveler

1320

01:02:41,920 --> 01:02:39,740

the time is going normally but the

1321

01:02:43,630 --> 01:02:41,930

because they're moving so fast the

1322

01:02:45,460 --> 01:02:43,640

length lengths are shortened so the

1323

01:02:49,060 --> 01:02:45,470

distance between themselves and Alpha

1324

01:02:52,210 --> 01:02:49,070

Centauri actually shrinks and they then

1325

01:02:53,890 --> 01:02:52,220

don't have as far to travel from their

1326

01:02:57,010 --> 01:02:53,900

perspective and that's basically how

1327

01:02:58,780 --> 01:02:57,020

those two perspectives are different but

1328

01:03:00,340 --> 01:02:58,790

they both lead to the same results they

1329

01:03:03,130 --> 01:03:00,350

both lead to the same result of the

1330

01:03:06,849 --> 01:03:03,140

traveler making it a short period of

1331

01:03:09,030 --> 01:03:06,859

time I noticed in constraints on

1332

01:03:12,580 --> 01:03:09,040

breakaway societies engaged in relative

1333

01:03:15,940 --> 01:03:12,590

relativistic interstellar travel the

1334

01:03:18,670 --> 01:03:15,950

paper that will actually the I guess was

1335

01:03:21,430 --> 01:03:18,680

a presentation that she did wanted to

1336

01:03:23,560 --> 01:03:21,440

know that you brought up I can never say

1337

01:03:24,730 --> 01:03:23,570

the scientists name correctly so you'll

1338

01:03:27,400 --> 01:03:24,740

have to correct me please

1339

01:03:32,710 --> 01:03:27,410

it's dr. you know Frank I have a problem

1340

01:03:34,840 --> 01:03:32,720

saying dr. miss you cook okay thank you

1341

01:03:38,530 --> 01:03:34,850

I always it always ends up sounding like

1342

01:03:39,580 --> 01:03:38,540

a wild bird who can never say his name

1343

01:03:41,140 --> 01:03:39,590

right thank you

1344

01:03:43,240 --> 01:03:41,150

I noticed that she brought up a paper

1345

01:03:45,640 --> 01:03:43,250

that he wrote which is the physics of

1346

01:03:48,880 --> 01:03:45,650

interstellar travel how did his paper

1347

01:03:50,680 --> 01:03:48,890

well his essay on that how did that the

1348

01:03:53,130 --> 01:03:50,690

article he wrote on that topic how did

1349

01:03:56,260 --> 01:03:53,140

it impact you and why was it a good

1350

01:03:57,790 --> 01:03:56,270

article I think I think I brought it up

1351

01:04:00,940 --> 01:03:57,800

because he made the point that

1352

01:04:03,070 --> 01:04:00,950

relativity works in your favor and I you

1353

01:04:07,210 --> 01:04:03,080

don't often hear scientists admitting to

1354

01:04:09,010 --> 01:04:07,220

that whether they're not generally aware

1355

01:04:13,590 --> 01:04:09,020

or realize that I don't know what the

1356

01:04:16,240 --> 01:04:13,600

situation is but but he but he actually

1357

01:04:17,500 --> 01:04:16,250

highlighted that fact that relativity

1358

01:04:21,400 --> 01:04:17,510

works in your favor and it's he's

1359

01:04:23,590 --> 01:04:21,410

absolutely correct but he didn't go that

1360

01:04:25,540 --> 01:04:23,600

next step in that he stalled out

1361

01:04:28,240 --> 01:04:25,550

basically where most other people have

1362

01:04:29,500 --> 01:04:28,250

where he said but for everybody back on

1363

01:04:31,870 --> 01:04:29,510

earth it's still going to take a long

1364

01:04:35,200 --> 01:04:31,880

period of time so why bother nobody who

1365

01:04:37,660 --> 01:04:35,210

would do this and I think that's the

1366

01:04:41,020 --> 01:04:37,670

that's a short sightedness on our part

1367

01:04:42,550 --> 01:04:41,030

not considering that now somebody wants

1368

01:04:43,900 --> 01:04:42,560

to do it we'll make it happen we'll find

1369

01:04:46,240 --> 01:04:43,910

a way to do it you'll find a way to do

1370

01:04:48,070 --> 01:04:46,250

it comfortably right and I'm glad you

1371

01:04:51,250 --> 01:04:48,080

brought up the idea of doing something

1372

01:04:53,710 --> 01:04:51,260

like that comfortably because I wanted

1373

01:04:56,589 --> 01:04:53,720

to know what kind of materials do you

1374

01:04:59,890 --> 01:04:56,599

feel hypothetically could be involved in

1375

01:05:04,870 --> 01:04:59,900

building a ship to be able to handle

1376

01:05:07,859 --> 01:05:04,880

going to an interstellar point this is

1377

01:05:11,050 --> 01:05:07,869

this is where we go from talking about

1378

01:05:13,210 --> 01:05:11,060

physical possibility to an engineering

1379

01:05:14,710 --> 01:05:13,220

possible to an engineering possibility

1380

01:05:16,740 --> 01:05:14,720

whether whether you whether you could

1381

01:05:18,849 --> 01:05:16,750

actually engineer something like this

1382

01:05:20,320 --> 01:05:18,859

so saying something is physically

1383

01:05:23,859 --> 01:05:20,330

possible means that the laws of physics

1384

01:05:25,930 --> 01:05:23,869

don't stop you from doing it whether you

1385

01:05:29,470 --> 01:05:25,940

can engineer something that will work is

1386

01:05:32,829 --> 01:05:29,480

the this is the next problem and the the

1387

01:05:35,950 --> 01:05:32,839

the the biggest problems are our

1388

01:05:37,450 --> 01:05:35,960

radiation you're basically going to have

1389

01:05:39,550 --> 01:05:37,460

all the lights going to be blue-shifted

1390

01:05:41,050 --> 01:05:39,560

into x-rays and gamma-rays so you're

1391

01:05:41,730 --> 01:05:41,060

gonna be bombarded with x-rays and

1392

01:05:46,720 --> 01:05:41,740

gamma-rays

1393

01:05:49,300 --> 01:05:46,730

you're going to because for the traveler

1394

01:05:51,640 --> 01:05:49,310

that the distances are shortened and the

1395

01:05:53,260 --> 01:05:51,650

distances shrink that means that the

1396

01:05:55,329 --> 01:05:53,270

hydrogen gas in interstellar space

1397

01:05:57,370 --> 01:05:55,339

interstellar space is not empty you've

1398

01:06:01,750 --> 01:05:57,380

got about one hydrogen atom per cubic

1399

01:06:03,579 --> 01:06:01,760

meter so so once you shrink that

1400

01:06:06,250 --> 01:06:03,589

distance you're basically turning empty

1401

01:06:07,810 --> 01:06:06,260

space into a to a wall of hydrogen gas

1402

01:06:10,570 --> 01:06:07,820

that you've got to fly through at 90%

1403

01:06:14,370 --> 01:06:10,580

the speed of light and that's gonna tear

1404

01:06:17,320 --> 01:06:14,380

any ship to shreds and in no time so you

1405

01:06:19,660 --> 01:06:17,330

really have to work on shielding and

1406

01:06:22,359 --> 01:06:19,670

coming up with ways to handle shielding

1407

01:06:24,099 --> 01:06:22,369

and that I would have no idea how to do

1408

01:06:34,240 --> 01:06:24,109

there's there have been a few papers

1409

01:06:36,550 --> 01:06:34,250

that I think I've I've referenced oh I

1410

01:06:39,690 --> 01:06:36,560

think I referenced on those slides in

1411

01:06:42,400 --> 01:06:39,700

the that talk I talked about a

1412

01:06:44,950 --> 01:06:42,410

traveler's scale of speeds at which

1413

01:06:46,690 --> 01:06:44,960

travelers can travel I'm actually gonna

1414

01:06:48,940 --> 01:06:46,700

pull it up on my computer so I can

1415

01:06:58,300 --> 01:06:48,950

oh good yeah forget what I'm talking

1416

01:07:02,890 --> 01:06:58,310

about go pre Tom yes I had come up with

1417

01:07:05,430 --> 01:07:02,900

a scale for a traveler's scale I didn't

1418

01:07:07,900 --> 01:07:05,440

find the the Kardashev scale which is

1419

01:07:12,550 --> 01:07:07,910

unfortunately Nikolai Kardashev passed

1420

01:07:14,640 --> 01:07:12,560

away the other day I'm sorry yeah but he

1421

01:07:16,930 --> 01:07:14,650

developed a scale that describes

1422

01:07:20,319 --> 01:07:16,940

civilizations as using certain months of

1423

01:07:25,530 --> 01:07:20,329

energy but I I came up with a scale of

1424

01:07:31,510 --> 01:07:25,540

traveller classes and there's a few

1425

01:07:35,620 --> 01:07:31,520

there's a few papers by semyonov I think

1426

01:07:38,410 --> 01:07:35,630

he's maybe at SUNY Stony Brook semyonov

1427

01:07:40,420 --> 01:07:38,420

but he has a paper on radiation hazards

1428

01:07:42,550 --> 01:07:40,430

of relativistic interstellar flight and

1429

01:07:46,599 --> 01:07:42,560

he talks about the shielding that would

1430

01:07:48,460 --> 01:07:46,609

be necessary so so for below 30% the

1431

01:07:49,810 --> 01:07:48,470

speed of light at titanium or aluminum

1432

01:07:50,349 --> 01:07:49,820

hull of one to two centimeters in

1433

01:07:52,690 --> 01:07:50,359

thickness

1434

01:07:56,280 --> 01:07:52,700

provides sufficient protection against

1435

01:07:59,559 --> 01:07:56,290

the flow of oncoming nucleonic radiation

1436

01:08:01,540 --> 01:07:59,569

but you're going to have a decoration of

1437

01:08:04,120 --> 01:08:01,550

the front part of the hull caused by

1438

01:08:06,190 --> 01:08:04,130

intense micro meteorite bombardment with

1439

01:08:07,960 --> 01:08:06,200

rate exceeding 100 relativistic dust

1440

01:08:09,970 --> 01:08:07,970

particles per square meter per second

1441

01:08:13,540 --> 01:08:09,980

greater than 30% of the speed of light

1442

01:08:19,329 --> 01:08:13,550

so things just get nastier is the faster

1443

01:08:23,050 --> 01:08:19,339

you go once you get above 70% the speed

1444

01:08:25,240 --> 01:08:23,060

of light hitting having a proton hitting

1445

01:08:27,820 --> 01:08:25,250

your spaceship actually creates

1446

01:08:29,289 --> 01:08:27,830

particles so I mean you basically it's

1447

01:08:32,320 --> 01:08:29,299

like you're flying through a particle

1448

01:08:34,920 --> 01:08:32,330

accelerator at that point so so the

1449

01:08:39,400 --> 01:08:34,930

engineering would be very challenging

1450

01:08:41,320 --> 01:08:39,410

now the question is whether you can so

1451
01:08:42,999 --> 01:08:41,330
here I'm talking about travelers who are

1452
01:08:46,269 --> 01:08:43,009
traveling at relativistic speeds using

1453
01:08:48,610 --> 01:08:46,279
you know conventional ways of moving

1454
01:08:52,660 --> 01:08:48,620
which is what you know I really only

1455
01:08:55,630 --> 01:08:52,670
considered in both of these talks if you

1456
01:08:57,999 --> 01:08:55,640
consider doing something like warping

1457
01:08:59,399 --> 01:08:58,009
space-time then you're then you're

1458
01:09:01,379 --> 01:08:59,409
playing a different game

1459
01:09:03,599 --> 01:09:01,389
changes and that's a different type of

1460
01:09:08,129 --> 01:09:03,609
engineering but that would require other

1461
01:09:11,519 --> 01:09:08,139
technology okay Kevin and this might

1462
01:09:13,469 --> 01:09:11,529
sound a little rap random but you did

1463
01:09:17,219 --> 01:09:13,479

say that there are serious implications

1464

01:09:19,829 --> 01:09:17,229

for the Fermi paradox since at any point

1465

01:09:22,140 --> 01:09:19,839

in time it is far more likely that any

1466

01:09:25,140 --> 01:09:22,150

given ship will be travelling to its

1467

01:09:31,829 --> 01:09:25,150

next destination and could you please

1468

01:09:34,140 --> 01:09:31,839

touch upon that topic travelers who are

1469

01:09:35,609 --> 01:09:34,150

traveling at relativistic speeds so

1470

01:09:38,729 --> 01:09:35,619

you're not talking about faster than

1471

01:09:40,979 --> 01:09:38,739

light travel then you know for those of

1472

01:09:42,719 --> 01:09:40,989

us at home it still takes hundreds of

1473

01:09:45,509 --> 01:09:42,729

years for a spacecraft to get anywhere

1474

01:09:48,359 --> 01:09:45,519

so it's if you're traveling hundreds of

1475

01:09:50,189 --> 01:09:48,369

light-years so where where do you expect

1476

01:09:52,019 --> 01:09:50,199

to find everybody well they're all

1477

01:09:53,159 --> 01:09:52,029

traveling that's basically where they

1478

01:09:55,020 --> 01:09:53,169

are that's where they spend most of

1479

01:09:56,669 --> 01:09:55,030

their time this spend hundreds of years

1480

01:09:58,259 --> 01:09:56,679

traveling and they'll probably hang out

1481

01:10:00,359 --> 01:09:58,269

on your planet for even if they play

1482

01:10:02,189 --> 01:10:00,369

even if they hang out on your planet for

1483

01:10:03,750 --> 01:10:02,199

a year they're still only spending one

1484

01:10:05,029 --> 01:10:03,760

percent of their time on a planet with

1485

01:10:07,049 --> 01:10:05,039

respect you know from your perspective

1486

01:10:08,729 --> 01:10:07,059

now from their perspective they're

1487

01:10:11,069 --> 01:10:08,739

spending most of their time on planets

1488

01:10:13,500 --> 01:10:11,079

but but from our perspective they're all

1489

01:10:15,270 --> 01:10:13,510

traveling that's so that would that

1490

01:10:16,649 --> 01:10:15,280

would be a possible solution to the

1491

01:10:23,549 --> 01:10:16,659

Fermi partnered paradox where is

1492

01:10:24,569 --> 01:10:23,559

everybody their only transit yeah okay

1493

01:10:26,640 --> 01:10:24,579

so I'd like to get a little bit more

1494

01:10:28,500 --> 01:10:26,650

personal about this topic because it's a

1495

01:10:30,569 --> 01:10:28,510

fascinating topic and I want to know

1496

01:10:37,439 --> 01:10:30,579

when did you first hear about the Fermi

1497

01:10:41,669 --> 01:10:37,449

paradox and why do you care about it I

1498

01:10:44,629 --> 01:10:41,679

don't really care about it that much

1499

01:10:52,949 --> 01:10:48,779

it's only a paradox if you assume that

1500

01:10:55,350 --> 01:10:52,959

nobody has been here we don't know that

1501
01:10:57,120 --> 01:10:55,360
for sure because we've not studied it so

1502
01:10:58,319 --> 01:10:57,130
nobody knows whether anybody's been here

1503
01:11:01,500 --> 01:10:58,329
before because it's not been

1504
01:11:03,359 --> 01:11:01,510
scientifically studied by anyone so you

1505
01:11:08,159 --> 01:11:03,369
can't say it's a paradox that's not a

1506
01:11:09,569 --> 01:11:08,169
really appropriate stay yeah just up for

1507
01:11:12,149 --> 01:11:09,579
a little bit of background on the Fermi

1508
01:11:12,910 --> 01:11:12,159
paradox it it is it I think it's a

1509
01:11:16,860 --> 01:11:12,920
presented

1510
01:11:20,650 --> 01:11:16,870
it's a much more how can I put it

1511
01:11:22,990 --> 01:11:20,660
studied sort of a formalized thing when

1512
01:11:26,200 --> 01:11:23,000
in fact it was really I just came about

1513
01:11:29,169 --> 01:11:26,210

from a conversation that at lunch among

1514

01:11:31,000 --> 01:11:29,179

a few scientists including Fermi Edward

1515

01:11:31,450 --> 01:11:31,010

Teller and some others as well right

1516

01:11:33,040 --> 01:11:31,460

sorry

1517

01:11:35,050 --> 01:11:33,050

that's right there was just that kicking

1518

01:11:36,939 --> 01:11:35,060

some ideas around at lunch basically and

1519

01:11:39,490 --> 01:11:36,949

it turned into something a little bit

1520

01:11:42,430 --> 01:11:39,500

more than that I mean except except he

1521

01:11:45,880 --> 01:11:42,440

was very good at making important

1522

01:11:49,270 --> 01:11:45,890

teaching points from seemingly innocuous

1523

01:11:52,800 --> 01:11:49,280

statements so he you know so you could

1524

01:11:55,150 --> 01:11:52,810

look at it that way in which in which

1525

01:11:58,660 --> 01:11:55,160

consider what is the teaching well

1526

01:12:01,209 --> 01:11:58,670

that's you know what's the teaching

1527

01:12:04,540 --> 01:12:01,219

point that yeah there ought to be aliens

1528

01:12:06,160 --> 01:12:04,550

here we should look for them is that the

1529

01:12:08,620 --> 01:12:06,170

teaching point or is the teaching point

1530

01:12:10,720 --> 01:12:08,630

that maybe there's a reason they can't

1531

01:12:13,900 --> 01:12:10,730

get here and we should think about that

1532

01:12:16,390 --> 01:12:13,910

so I wanted to bring up metamaterial

1533

01:12:18,760 --> 01:12:16,400

research which is interdisciplinary and

1534

01:12:21,130 --> 01:12:18,770

involves fields such as electrical

1535

01:12:23,290 --> 01:12:21,140

engineering electro magnetics classical

1536

01:12:25,450 --> 01:12:23,300

optics solid state physics microwave and

1537

01:12:27,430 --> 01:12:25,460

antenna engineering optoelectronics

1538

01:12:29,650 --> 01:12:27,440

material sciences nanoscience and

1539

01:12:32,260 --> 01:12:29,660

semiconductor engineering do you think

1540

01:12:34,750 --> 01:12:32,270

that metamaterials has anything to do

1541

01:12:36,610 --> 01:12:34,760

with the building of a ship and I do by

1542

01:12:39,160 --> 01:12:36,620

the way let me before I finish that

1543

01:12:41,229 --> 01:12:39,170

question I still have more another

1544

01:12:44,080 --> 01:12:41,239

question for you about that topic

1545

01:12:46,570 --> 01:12:44,090

metamaterials do you think that meta

1546

01:12:57,010 --> 01:12:46,580

materials would be required in order to

1547

01:12:59,169 --> 01:12:57,020

build a ship to go interstellar material

1548

01:13:04,720 --> 01:12:59,179

seem to be useful for a great many

1549

01:13:06,790 --> 01:13:04,730

things so maybe for the technology on

1550

01:13:07,900 --> 01:13:06,800

the ship it's possible but anyway I

1551

01:13:10,630 --> 01:13:07,910

wanted to ask you

1552

01:13:12,910 --> 01:13:10,640

metamaterials is such a hot topic it's

1553

01:13:16,090 --> 01:13:12,920

trending in the UFO community probably

1554

01:13:17,950 --> 01:13:16,100

all year part of last year it's probably

1555

01:13:19,419 --> 01:13:17,960

been talked about a lot longer but I

1556

01:13:21,160 --> 01:13:19,429

mean as far as trending and everybody

1557

01:13:23,350 --> 01:13:21,170

talking about it what are your thoughts

1558

01:13:26,650 --> 01:13:23,360

on that topic regarding meta materials

1559

01:13:29,440 --> 01:13:26,660

and the UFO topic

1560

01:13:32,080 --> 01:13:29,450

I think it's too early to jump to any

1561

01:13:34,600 --> 01:13:32,090

conclusions I think that we would do

1562

01:13:36,850 --> 01:13:34,610

best by keeping all the hypotheses on

1563

01:13:39,910 --> 01:13:36,860

the table until we have data to rule

1564

01:13:42,610 --> 01:13:39,920

some out or to really support some you

1565

01:13:44,140 --> 01:13:42,620

know we have there are some materials

1566

01:13:46,240 --> 01:13:44,150

floating around that are purported to be

1567

01:13:49,150 --> 01:13:46,250

whole material from some of these

1568

01:13:51,520 --> 01:13:49,160

objects and these things are look like

1569

01:13:54,490 --> 01:13:51,530

they're meta materials some of them are

1570

01:13:58,510 --> 01:13:54,500

layered nano layers of magnesium and

1571

01:14:01,620 --> 01:13:58,520

bismuth and that's interesting these

1572

01:14:05,710 --> 01:14:01,630

things have interesting properties and

1573

01:14:08,500 --> 01:14:05,720

whether they are you know important or

1574

01:14:11,500 --> 01:14:08,510

central I don't think is known yet it's

1575

01:14:13,030 --> 01:14:11,510

also not known it's also not been proved

1576

01:14:16,120 --> 01:14:13,040

that those are actually home materials

1577

01:14:18,430 --> 01:14:16,130

from actual craft you know these you

1578

01:14:20,590 --> 01:14:18,440

know one case these materials were just

1579

01:14:25,090 --> 01:14:20,600

worse you know sent to an investigative

1580

01:14:26,560 --> 01:14:25,100

you know reporter and and until we know

1581

01:14:28,180 --> 01:14:26,570

where they came from and we can actually

1582

01:14:29,860 --> 01:14:28,190

look at the craft and look at the

1583

01:14:31,630 --> 01:14:29,870

equipment in the craft and know where

1584

01:14:33,790 --> 01:14:31,640

the how the craft was collected what

1585

01:14:35,910 --> 01:14:33,800

happened to it I think it's very

1586

01:14:41,230 --> 01:14:35,920

difficult to say anything definitively

1587

01:14:44,430 --> 01:14:41,240

okay and now our TTS say has a project

1588

01:14:47,020 --> 01:14:44,440

called the atom research project and

1589

01:14:50,610 --> 01:14:47,030

what they do is they focus in on

1590

01:14:54,580 --> 01:14:50,620

studying exotic materials for technology

1591

01:14:58,390 --> 01:14:54,590

innovation do you have any opinions on

1592

01:15:02,610 --> 01:14:58,400

that at all yes I think it's great

1593

01:15:08,290 --> 01:15:05,950

which is an important thing to do I good

1594

01:15:09,760 --> 01:15:08,300

I find it frustrating when I see

1595

01:15:12,580 --> 01:15:09,770

professional scientists making

1596

01:15:14,100 --> 01:15:12,590

professional statements without having

1597

01:15:16,570 --> 01:15:14,110

done their homework and I think that's

1598

01:15:18,880 --> 01:15:16,580

you know I know I saw a video where

1599

01:15:20,290 --> 01:15:18,890

Stanton Freeman you know expressed his

1600

01:15:23,200 --> 01:15:20,300

frustration with this and I share that

1601

01:15:25,180 --> 01:15:23,210

frustration and I'm glad to see

1602

01:15:27,790 --> 01:15:25,190

scientists doing what they do best study

1603

01:15:29,170 --> 01:15:27,800

it will let me once you once you've

1604

01:15:31,240 --> 01:15:29,180

learned something tell us what you

1605

01:15:33,100 --> 01:15:31,250

learned let me jump in real quick

1606

01:15:35,080 --> 01:15:33,110

professor and ask you this well let's

1607

01:15:38,440 --> 01:15:35,090

say that that your friend Joey had

1608

01:15:40,270 --> 01:15:38,450

during his sighting picked up a fragment

1609

01:15:43,899 --> 01:15:40,280

they this fell off the UFO

1610

01:15:45,580 --> 01:15:43,909

that I saw Kevin and if you got your

1611

01:15:48,520 --> 01:15:45,590

hands on something like that from a

1612

01:15:59,010 --> 01:15:48,530

source that you find credible what would

1613

01:16:04,000 --> 01:15:59,020

you do with it or you know and look for

1614

01:16:07,660 --> 01:16:04,010

look for the look for the isotope ratios

1615

01:16:09,430 --> 01:16:07,670

I use Raman spectroscopy and look and

1616

01:16:11,589 --> 01:16:09,440

see if there's carbon nanotubes or any

1617

01:16:13,029 --> 01:16:11,599

organics present there's a lot of things

1618

01:16:15,640 --> 01:16:13,039

you could do and it would be a great fun

1619

01:16:18,520 --> 01:16:15,650

and I and in fact I'm in contact with

1620

01:16:20,020 --> 01:16:18,530

two separate individuals at this point

1621

01:16:22,180 --> 01:16:20,030

and we're discussing you know the

1622

01:16:25,689 --> 01:16:22,190

possibility of me looking at some of

1623

01:16:27,069 --> 01:16:25,699

this some of this materials so that's an

1624

01:16:28,600 --> 01:16:27,079

exciting thing to do I think it's

1625

01:16:33,760 --> 01:16:28,610

something that we scientists ought to be

1626

01:16:36,279 --> 01:16:33,770

doing and and that's that's important

1627

01:16:38,649 --> 01:16:36,289

it'll add to the body of evidence that

1628

01:16:41,020 --> 01:16:38,659

we'll have to slowly build up as we

1629

01:16:43,750 --> 01:16:41,030

slowly come to terms and understand what

1630

01:16:45,189 --> 01:16:43,760

these things actually are yeah and I'm

1631

01:16:46,359 --> 01:16:45,199

glad you brought up the word evidence

1632

01:16:48,069 --> 01:16:46,369

although I know it's been used

1633

01:16:53,709 --> 01:16:48,079

frequently throughout this discussion

1634

01:16:57,189 --> 01:16:53,719

off and on the idea of evidence facts

1635

01:17:00,729 --> 01:16:57,199

and proof and then let's just throw in

1636

01:17:03,069 --> 01:17:00,739

for good measure what is good data so

1637

01:17:06,430 --> 01:17:03,079

those four things can you please tell us

1638

01:17:13,450 --> 01:17:06,440

in your world of science what do facts

1639

01:17:16,930 --> 01:17:13,460

evidence good data and proof mean well

1640

01:17:18,790 --> 01:17:16,940

you know facts facts facts are facts or

1641

01:17:21,040 --> 01:17:18,800

things you know and you know and

1642

01:17:23,560 --> 01:17:21,050

evidences is closely related to this

1643

01:17:25,689 --> 01:17:23,570

evidence is something usually based on

1644

01:17:31,359 --> 01:17:25,699

something that you can measure or have

1645

01:17:36,310 --> 01:17:31,369

measured good data is data that allows

1646

01:17:39,100 --> 01:17:36,320

you to make rather definitive inferences

1647

01:17:41,229 --> 01:17:39,110

from the data alone so so if you have

1648

01:17:43,689 --> 01:17:41,239

and that's basically what we mean by

1649

01:17:46,569 --> 01:17:43,699

good data so when you have sufficient

1650

01:17:47,950 --> 01:17:46,579

data that you can make the inferences

1651

01:17:51,189 --> 01:17:47,960

you want to and say something definitive

1652

01:17:54,209 --> 01:17:51,199

about whatever you're studying based on

1653

01:17:56,400 --> 01:17:54,219

that data that's good data

1654

01:18:00,000 --> 01:17:56,410

it's usually not the case that your date

1655

01:18:03,590 --> 01:18:00,010

is very good and and a lot of times in

1656

01:18:05,880 --> 01:18:03,600

science you were you are working with

1657

01:18:08,760 --> 01:18:05,890

you know what you mean by good data

1658

01:18:12,330 --> 01:18:08,770

changes so I also work with exoplanet

1659

01:18:15,030 --> 01:18:12,340

detection and and in that case we've

1660

01:18:18,060 --> 01:18:15,040

taken data from the Kepler space

1661

01:18:19,650 --> 01:18:18,070

telescope that I think you put a picture

1662

01:18:21,810 --> 01:18:19,660

up earlier that showed you know the

1663

01:18:24,950 --> 01:18:21,820

Kepler looking up at the sky near the

1664

01:18:26,850 --> 01:18:24,960

constellation of Lyra and such and

1665

01:18:30,390 --> 01:18:26,860

basically the Kepler space telescope

1666

01:18:32,580 --> 01:18:30,400

would watch stars for several years and

1667

01:18:37,050 --> 01:18:32,590

basically record their light intensities

1668

01:18:40,410 --> 01:18:37,060

know when you have periodic decreases in

1669

01:18:45,060 --> 01:18:40,420

light intensity you can use that to

1670

01:18:47,310 --> 01:18:45,070

infer the presence of planets now if you

1671

01:18:50,640 --> 01:18:47,320

aren't knowledgeable about how planets

1672

01:18:52,979 --> 01:18:50,650

orbit stars you could argue that that's

1673

01:18:55,740 --> 01:18:52,989

really pretty horrible data and horrible

1674

01:18:57,090 --> 01:18:55,750

evidence for a planet because what if

1675

01:18:57,780 --> 01:18:57,100

there are sunspots what if it's

1676

01:18:59,580 --> 01:18:57,790

something else

1677

01:19:01,680 --> 01:18:59,590

you know and and sometimes that happens

1678

01:19:04,830 --> 01:19:01,690

you know sometimes we need data from

1679

01:19:09,090 --> 01:19:04,840

another source so very often that's

1680

01:19:11,160 --> 01:19:09,100

actually why we have two categories you

1681

01:19:13,590 --> 01:19:11,170

have exoplanet candidates and then you

1682

01:19:16,560 --> 01:19:13,600

have discovered exoplanets and they're

1683

01:19:18,570 --> 01:19:16,570

different candidates are exoplanets that

1684

01:19:20,910 --> 01:19:18,580

have been detected using one imaging

1685

01:19:22,770 --> 01:19:20,920

modality maybe light from Kepler and

1686

01:19:24,600 --> 01:19:22,780

then what you would do is you basically

1687

01:19:26,760 --> 01:19:24,610

would go and say well let's look at that

1688

01:19:28,410 --> 01:19:26,770

star you know more closely let's record

1689

01:19:31,140 --> 01:19:28,420

spectra from the star and see if we can

1690

01:19:32,520 --> 01:19:31,150

detect the star wobbling and perform

1691

01:19:34,920 --> 01:19:32,530

what's are called radial velocity

1692

01:19:36,780 --> 01:19:34,930

measurements and then once you've got

1693

01:19:38,790 --> 01:19:36,790

radio velocity data along with the

1694

01:19:40,650 --> 01:19:38,800

Kepler data then you've confirmed that

1695

01:19:43,260 --> 01:19:40,660

there's a planet there you know then

1696

01:19:48,600 --> 01:19:43,270

people will feel relatively here that

1697

01:19:50,790 --> 01:19:48,610

yeah it's probably a planet so so those

1698

01:19:54,060 --> 01:19:50,800

are those are those are all difficult

1699

01:19:57,300 --> 01:19:54,070

issues and then in this this topic it's

1700

01:19:58,950 --> 01:19:57,310

extremely difficult you have you're

1701

01:20:01,770 --> 01:19:58,960

studying a phenomenon that you can't

1702

01:20:05,430 --> 01:20:01,780

control and a phenomenon that does not

1703

01:20:10,189 --> 01:20:05,440

happen regularly so it's those are the

1704

01:20:12,150 --> 01:20:10,199

hardest things to study and and

1705

01:20:15,630 --> 01:20:12,160

traditionally these have been very

1706

01:20:18,540 --> 01:20:15,640

difficult areas and I remember back when

1707

01:20:21,570 --> 01:20:18,550

I was at NASA Ames I was in a poster

1708

01:20:23,610 --> 01:20:21,580

session presenting some of my work that

1709

01:20:26,580 --> 01:20:23,620

had been funded by the DDF which was a

1710

01:20:29,130 --> 01:20:26,590

discretionary director's fund we were

1711

01:20:31,709 --> 01:20:29,140

modeling planetary nebula and I was at

1712

01:20:34,110 --> 01:20:31,719

the poster session and the poster next

1713

01:20:35,820 --> 01:20:34,120

to me was from another scientist was

1714

01:20:38,430 --> 01:20:35,830

also funded in the same program his name

1715

01:20:41,130 --> 01:20:38,440

was Friedman Freund and it was a poster

1716

01:20:43,350 --> 01:20:41,140

on earthquake lights and I had never

1717

01:20:44,850 --> 01:20:43,360

heard of earthquake lights so I kind of

1718

01:20:47,010 --> 01:20:44,860

looked at his poster a little bit and

1719

01:20:48,419 --> 01:20:47,020

you know we talked about earthquake

1720

01:20:51,479 --> 01:20:48,429

lights as being lights that appear above

1721

01:20:55,200 --> 01:20:51,489

the ground during earthquakes and and

1722

01:20:57,870 --> 01:20:55,210

his poster was mainly on how rocks can

1723

01:20:59,070 --> 01:20:57,880

conduct electricity and under large

1724

01:21:00,900 --> 01:20:59,080

amounts of pressure you have

1725

01:21:03,750 --> 01:21:00,910

piezoelectric effects that create high

1726

01:21:05,370 --> 01:21:03,760

electric fields and such and and you

1727

01:21:07,110 --> 01:21:05,380

know it looks kind of reasonable but I

1728

01:21:10,500 --> 01:21:07,120

kind of was talking to a friend of mine

1729

01:21:12,750 --> 01:21:10,510

and a couple of my other friends came by

1730

01:21:13,890 --> 01:21:12,760

and I said this is an interesting poster

1731

01:21:16,110 --> 01:21:13,900

over here what do you make of this

1732

01:21:17,520 --> 01:21:16,120

earthquake light stuff and they were all

1733

01:21:18,959 --> 01:21:17,530

pretty much they putting this at oh

1734

01:21:21,570 --> 01:21:18,969

that's Friedman Fridays

1735

01:21:23,100 --> 01:21:21,580

he's kind of not studying he's been

1736

01:21:24,810 --> 01:21:23,110

going on about earthquake lights for

1737

01:21:26,939 --> 01:21:24,820

years you know people apparently have

1738

01:21:29,220 --> 01:21:26,949

been reporting lights during earthquakes

1739

01:21:30,450 --> 01:21:29,230

you know for centuries and he thinks

1740

01:21:32,160 --> 01:21:30,460

they're real things but they're probably

1741

01:21:33,660 --> 01:21:32,170

just psychological people under

1742

01:21:37,350 --> 01:21:33,670

psychological stress from being in an

1743

01:21:38,729 --> 01:21:37,360

earthquake and so you know a couple of

1744

01:21:40,229 --> 01:21:38,739

my friends said all the same thing they

1745

01:21:41,700 --> 01:21:40,239

all thought he was kind of crazy and so

1746

01:21:44,459 --> 01:21:41,710

I went over and talked to him and had

1747

01:21:46,380 --> 01:21:44,469

him give me a walkthrough and you know

1748

01:21:48,090 --> 01:21:46,390

it seemed reasonable to me it didn't

1749

01:21:50,130 --> 01:21:48,100

seem very far out you know he had

1750

01:21:52,890 --> 01:21:50,140

explanations for everything and he

1751

01:21:55,050 --> 01:21:52,900

wanted to study these effects because

1752

01:21:56,580 --> 01:21:55,060

they would you know if you understood

1753

01:21:58,229 --> 01:21:56,590

this then you should be able to detect

1754

01:22:00,390 --> 01:21:58,239

the electric fields before earthquakes

1755

01:22:01,830 --> 01:22:00,400

happen and you could develop earthquake

1756

01:22:04,860 --> 01:22:01,840

detection systems which I would imagine

1757

01:22:06,510 --> 01:22:04,870

people would be interested in but he had

1758

01:22:07,770 --> 01:22:06,520

been unable to get the interest of

1759

01:22:11,280 --> 01:22:07,780

anyone from the american geophysical

1760

01:22:13,169 --> 01:22:11,290

union and he was quite frustrated and he

1761

01:22:15,410 --> 01:22:13,179

was quite old already at that time and

1762

01:22:20,300 --> 01:22:15,420

so

1763

01:22:23,690 --> 01:22:20,310

can google earth quake lights and just a

1764

01:22:26,260 --> 01:22:23,700

few years ago there was there were two

1765

01:22:28,340 --> 01:22:26,270

earthquakes back-to-back and the

1766

01:22:30,820 --> 01:22:28,350

security cameras had picked up

1767

01:22:34,400 --> 01:22:30,830

earthquake lights in both cases and so

1768

01:22:37,460 --> 01:22:34,410

people became pretty convinced that

1769

01:22:39,710 --> 01:22:37,470

these were real things and so of course

1770

01:22:41,810 --> 01:22:39,720

this hit the news and was all over the

1771

01:22:43,970 --> 01:22:41,820

news and you know who did they go to

1772

01:22:46,250 --> 01:22:43,980

well they went to the only expert in the

1773

01:22:47,720 --> 01:22:46,260

world he knew anything about which was

1774

01:22:49,280 --> 01:22:47,730

Friedman Freud and I was really glad to

1775

01:22:51,710 --> 01:22:49,290

see that he was still around to be able

1776

01:22:54,140 --> 01:22:51,720

to enjoy the fact that he was vindicated

1777

01:22:55,640 --> 01:22:54,150

he was absolutely right but but the

1778

01:22:57,560 --> 01:22:55,650

problem is how do you study something

1779

01:22:58,730 --> 01:22:57,570

that you can't control you can't he

1780

01:23:00,500 --> 01:22:58,740

doesn't know where the next earthquakes

1781

01:23:02,330 --> 01:23:00,510

gonna be so we can't set up equipment to

1782

01:23:04,130 --> 01:23:02,340

measure these things and that makes it

1783

01:23:08,660 --> 01:23:04,140

very difficult you have to sit on and

1784

01:23:10,970 --> 01:23:08,670

wait until you can get data so you it

1785

01:23:11,900 --> 01:23:10,980

becomes a difficult game I also think

1786

01:23:14,570 --> 01:23:11,910

about it this way I think about

1787

01:23:17,200 --> 01:23:14,580

supernovas means we still don't

1788

01:23:21,560 --> 01:23:17,210

understand how all supernovas work right

1789

01:23:23,510 --> 01:23:21,570

but we have plenty of evidence that

1790

01:23:26,030 --> 01:23:23,520

there are supernovas however imagine

1791

01:23:28,490 --> 01:23:26,040

that supernovas were maybe a hundred

1792

01:23:31,460 --> 01:23:28,500

times rarer than they are so that you

1793

01:23:33,890 --> 01:23:31,470

would only see them once a century well

1794

01:23:35,360 --> 01:23:33,900

you would have we could have gone the

1795

01:23:37,490 --> 01:23:35,370

last hundred years without seeing a

1796

01:23:39,440 --> 01:23:37,500

supernova without it being recorded by

1797

01:23:41,840 --> 01:23:39,450

you know modern telescopes with CCD

1798

01:23:44,750 --> 01:23:41,850

cameras and do you think astronomers

1799

01:23:47,180 --> 01:23:44,760

would believe in supernovas based on the

1800

01:23:49,940 --> 01:23:47,190

Chinese reports and you know in the year

1801
01:23:52,370 --> 01:23:49,950
1000 that made the Crab Nebula or Tycho

1802
01:23:53,360 --> 01:23:52,380
Brahe his report yeah do you think

1803
01:23:55,400 --> 01:23:53,370
scientists would have believed that

1804
01:23:58,310 --> 01:23:55,410
there were such things as supernovas

1805
01:23:59,570 --> 01:23:58,320
based based on that I'm not sure they

1806
01:24:01,120 --> 01:23:59,580
would I don't think they did anybody

1807
01:24:04,100 --> 01:24:01,130
believe it

1808
01:24:06,490 --> 01:24:04,110
so what constitutes good evidence is is

1809
01:24:09,350 --> 01:24:06,500
really difficult and it depends on

1810
01:24:11,480 --> 01:24:09,360
depends greatly on what you know already

1811
01:24:13,400 --> 01:24:11,490
you know which depends greatly on your

1812
01:24:15,740 --> 01:24:13,410
models so we have excellent models on

1813
01:24:18,740 --> 01:24:15,750

how planets orbit stars we know all

1814

01:24:20,390 --> 01:24:18,750

about this and so these little light

1815

01:24:22,760 --> 01:24:20,400

dimming events that you get come from

1816

01:24:23,569 --> 01:24:22,770

Kepler I think constitute excellent data

1817

01:24:25,129 --> 01:24:23,579

but

1818

01:24:26,930 --> 01:24:25,139

from somebody who doesn't know anything

1819

01:24:30,680 --> 01:24:26,940

about planets orbiting stars they would

1820

01:24:34,819 --> 01:24:30,690

think it was pretty crappy data I wanted

1821

01:24:39,500 --> 01:24:34,829

to ask you about quantum physics and do

1822

01:24:44,419 --> 01:24:39,510

you ever have to diss quantum physics or

1823

01:24:49,430 --> 01:24:44,429

any type of quantum subject matter enter

1824

01:24:53,950 --> 01:24:50,649

[Music]

1825

01:24:56,510 --> 01:24:53,960

foundation so basically I work on

1826

01:24:59,419 --> 01:24:56,520

deriving some of the basic laws of

1827

01:25:01,129 --> 01:24:59,429

quantum mechanics order known mainly as

1828

01:25:02,720 --> 01:25:01,139

the Fineman rules and the born rule and

1829

01:25:05,390 --> 01:25:02,730

things like this on how you do

1830

01:25:08,390 --> 01:25:05,400

computations in quantum mechanics okay

1831

01:25:11,120 --> 01:25:08,400

and then I wanted to know do you feel

1832

01:25:12,919 --> 01:25:11,130

like Einstein had a this might be an

1833

01:25:15,979 --> 01:25:12,929

understatement but a real issue so to

1834

01:25:25,339 --> 01:25:15,989

speak regarding quantum physics was it a

1835

01:25:28,129 --> 01:25:25,349

nightmare for him nobody saw it coming

1836

01:25:33,589 --> 01:25:28,139

so it was it was a surprise to everybody

1837

01:25:35,689 --> 01:25:33,599

and people still struggle with quantum

1838

01:25:37,160 --> 01:25:35,699

mechanics you know professionals still

1839

01:25:38,780 --> 01:25:37,170

start with struggle trying to understand

1840

01:25:41,120 --> 01:25:38,790

quantum mechanics so I think it's I

1841

01:25:43,760 --> 01:25:41,130

don't you know he had as much trouble as

1842

01:25:46,790 --> 01:25:43,770

anybody else did yeah I actually have a

1843

01:25:49,930 --> 01:25:46,800

wonderful book here called genius about

1844

01:25:53,060 --> 01:25:49,940

the life and science of richard fineman

1845

01:25:57,319 --> 01:25:53,070

yeah one of my favorite books it's very

1846

01:25:59,510 --> 01:25:57,329

well very worn out wanted to ask you do

1847

01:26:01,910 --> 01:25:59,520

you will actually wanted to make a

1848

01:26:05,870 --> 01:26:01,920

comment yeah I was watching a

1849

01:26:08,060 --> 01:26:05,880

documentary on phiman and I I believe he

1850

01:26:11,689 --> 01:26:08,070

said something to the effect of a class

1851
01:26:13,280 --> 01:26:11,699
he was teaching about quantum physics he

1852
01:26:14,330 --> 01:26:13,290
kind of laughed because he said we

1853
01:26:18,200 --> 01:26:14,340
really don't know what we're talking

1854
01:26:22,250 --> 01:26:18,210
about we don't know how do you feel

1855
01:26:23,660 --> 01:26:22,260
about that that's in some ways that's

1856
01:26:25,370 --> 01:26:23,670
correct I mean we know a lot about

1857
01:26:27,740 --> 01:26:25,380
quantum mechanics and we know we

1858
01:26:29,750 --> 01:26:27,750
certainly know how to use it you know we

1859
01:26:31,160 --> 01:26:29,760
know how to mathematically describe

1860
01:26:34,060 --> 01:26:31,170
what's happening we know how to make

1861
01:26:35,959 --> 01:26:34,070
predictions and that's very practical

1862
01:26:40,040 --> 01:26:35,969
but

1863
01:26:43,139 --> 01:26:40,050

we don't have a good idea of the

1864

01:26:45,479 --> 01:26:43,149

theoretical underpinnings and why those

1865

01:26:47,129 --> 01:26:45,489

mathematical relations should hold in

1866

01:26:49,079 --> 01:26:47,139

those cases and why you should be doing

1867

01:26:51,479 --> 01:26:49,089

the calculations that you do that you

1868

01:26:53,609 --> 01:26:51,489

need to do that's that's where it gets

1869

01:26:55,799 --> 01:26:53,619

to be really difficult so this is a

1870

01:26:58,379 --> 01:26:55,809

quantum entanglement a big part of that

1871

01:27:08,129 --> 01:26:58,389

weirdness and Ric makes it that

1872

01:27:09,540 --> 01:27:08,139

difficult to understand although we're

1873

01:27:12,989 --> 01:27:09,550

not supposed to say that scientists

1874

01:27:15,149 --> 01:27:12,999

scientists that we had we had written

1875

01:27:17,129 --> 01:27:15,159

the paper and two colleagues and me have

1876

01:27:20,669 --> 01:27:17,139

written a paper on deriving the fine

1877

01:27:28,109 --> 01:27:20,679

minerals and sent it to the sensitive

1878

01:27:30,029 --> 01:27:28,119

phys Rev and in the introduction we said

1879

01:27:33,029 --> 01:27:30,039

that quantum mechanics was strange and

1880

01:27:35,159 --> 01:27:33,039

we were scolded by the reviewers for for

1881

01:27:37,109 --> 01:27:35,169

describing any physical theory as

1882

01:27:40,709 --> 01:27:37,119

strange they said that was

1883

01:27:43,290 --> 01:27:40,719

unprofessional but whatever yeah just

1884

01:27:45,359 --> 01:27:43,300

real quick also wear with your with your

1885

01:27:46,229 --> 01:27:45,369

astronomy background we've kept you a

1886

01:27:49,229 --> 01:27:46,239

little longer than we were originally

1887

01:27:52,020 --> 01:27:49,239

planning but those fine things have

1888

01:27:55,259 --> 01:27:52,030

really moved on at a good clip I'd

1889

01:27:59,369 --> 01:27:55,269

posted a story at my UFO group regarding

1890

01:28:03,089 --> 01:27:59,379

at the Big Bang Theory today and it was

1891

01:28:05,369 --> 01:28:03,099

it was asked how do we how do we know

1892

01:28:07,049 --> 01:28:05,379

and I don't really believe the Big Bang

1893

01:28:09,209 --> 01:28:07,059

Theory this is one of the commenters and

1894

01:28:11,639 --> 01:28:09,219

you know I wanted to ask you about the

1895

01:28:13,979 --> 01:28:11,649

the Big Bang Theory yeah basically what

1896

01:28:18,209 --> 01:28:13,989

I think is could be I guess best

1897

01:28:20,040 --> 01:28:18,219

described as a theory regarding the the

1898

01:28:22,079 --> 01:28:20,050

beginning of the universe I'm sure

1899

01:28:23,669 --> 01:28:22,089

that's not quite correct but can you go

1900

01:28:25,739 --> 01:28:23,679

into a little bit about that and how do

1901

01:28:33,899 --> 01:28:25,749

how did that the theory come about and

1902

01:28:37,799 --> 01:28:33,909

what there is a based I don't know a

1903

01:28:41,250 --> 01:28:37,809

whole lot about the details the the I

1904

01:28:43,679 --> 01:28:41,260

mean the basic idea is that the galaxies

1905

01:28:46,739 --> 01:28:43,689

are observed to be accelerating away

1906

01:28:47,920 --> 01:28:46,749

from one another and so the universe is

1907

01:28:51,130 --> 01:28:47,930

expanding

1908

01:28:53,500 --> 01:28:51,140

that suggests that it was once much

1909

01:28:57,640 --> 01:28:53,510

smaller that's basically the idea of the

1910

01:29:00,610 --> 01:28:57,650

Big Bang now there's then a whole you

1911

01:29:03,730 --> 01:29:00,620

know the whole field of cosmology works

1912

01:29:07,450 --> 01:29:03,740

on study on studying how our universe

1913

01:29:09,670 --> 01:29:07,460

evolves a lot of this is based on the

1914

01:29:12,250 --> 01:29:09,680

you know the formulation of general

1915

01:29:14,860 --> 01:29:12,260

relativity and how things expand under

1916

01:29:16,810 --> 01:29:14,870

gravity you know how does gravity make

1917

01:29:19,720 --> 01:29:16,820

things expand in addition to attract

1918

01:29:25,000 --> 01:29:19,730

right this is the the interesting thing

1919

01:29:27,100 --> 01:29:25,010

about the theory and and and then you

1920

01:29:29,320 --> 01:29:27,110

have to worry about what the universe

1921

01:29:30,910 --> 01:29:29,330

was like in the early stages and you

1922

01:29:33,250 --> 01:29:30,920

know we have theories that describe what

1923

01:29:35,710 --> 01:29:33,260

all this should be like and we look at

1924

01:29:38,110 --> 01:29:35,720

the current state of the universe to see

1925

01:29:40,210 --> 01:29:38,120

if that those ideas are actually

1926

01:29:42,610 --> 01:29:40,220

supported with what we think it probably

1927

01:29:43,990 --> 01:29:42,620

looked like earlier so so if you have a

1928

01:29:45,760 --> 01:29:44,000

theory of what it looked like in the

1929

01:29:47,530 --> 01:29:45,770

beginning you should have some idea of

1930

01:29:49,780 --> 01:29:47,540

what it looks like now and that's that's

1931

01:29:52,270 --> 01:29:49,790

how you can work to verify these

1932

01:29:54,940 --> 01:29:52,280

theories so so there is a body of

1933

01:29:57,520 --> 01:29:54,950

evidence much you know much greater than

1934

01:29:59,580 --> 01:29:57,530

just the expansion of the you know the

1935

01:30:02,500 --> 01:29:59,590

fact that galaxies are moving apart that

1936

01:30:03,940 --> 01:30:02,510

supports the the idea of the Big Bang

1937

01:30:07,600 --> 01:30:03,950

you know another piece of evidence is

1938

01:30:09,460 --> 01:30:07,610

the abundance ratios of the elements the

1939

01:30:11,200 --> 01:30:09,470

fact that you know most of the universe

1940

01:30:12,130 --> 01:30:11,210

is hydrogen and then you've got helium

1941

01:30:15,340 --> 01:30:12,140

and and so on

1942

01:30:17,440 --> 01:30:15,350

you know that's but those actual those

1943

01:30:19,630 --> 01:30:17,450

actual ratios are actually predicted by

1944

01:30:22,090 --> 01:30:19,640

the Big Bang Theory as well so as well

1945

01:30:23,950 --> 01:30:22,100

as other pieces of the data before we

1946

01:30:27,940 --> 01:30:23,960

wrap this up I have a question for you

1947

01:30:33,130 --> 01:30:27,950

that has really annoyed a part of the

1948

01:30:38,250 --> 01:30:33,140

UFO community and that is it's sort of a

1949

01:30:41,340 --> 01:30:38,260

rampant bad habit of various groups of

1950

01:30:44,470 --> 01:30:41,350

well some people and some organizations

1951

01:30:48,610 --> 01:30:44,480

who come forward to making claims that

1952

01:30:50,830 --> 01:30:48,620

they have found certain scientific they

1953

01:30:53,170 --> 01:30:50,840

have certain scientific discoveries but

1954

01:30:57,100 --> 01:30:53,180

they never have any scientific data or

1955

01:30:59,050 --> 01:30:57,110

reports to back up their claims so what

1956

01:31:01,570 --> 01:30:59,060

would you what are your thoughts on

1957

01:31:01,870 --> 01:31:01,580

folks who are making claims that they

1958

01:31:04,120 --> 01:31:01,880

have

1959

01:31:07,950 --> 01:31:04,130

some kind of scientific breakthrough or

1960

01:31:11,229 --> 01:31:07,960

scientific discovery about some topic

1961

01:31:14,410 --> 01:31:11,239

but they don't have any data or reports

1962

01:31:17,470 --> 01:31:14,420

to back up their claims what does one do

1963

01:31:26,410 --> 01:31:17,480

about that D I mean how do you respond

1964

01:31:30,069 --> 01:31:26,420

to something like that so then let me go

1965

01:31:31,990 --> 01:31:30,079

ahead it's not supported support for

1966

01:31:33,160 --> 01:31:32,000

their statements so then okay let me go

1967

01:31:34,800 --> 01:31:33,170

ahead and narrow it down a little bit

1968

01:31:38,020 --> 01:31:34,810

more I'll give you an example

1969

01:31:42,660 --> 01:31:38,030

TTS a I don't know Frank do you think

1970

01:31:49,240 --> 01:31:45,720

where they have actually made claims

1971

01:31:51,580 --> 01:31:49,250

like for example and by the way I'm not

1972

01:31:54,069 --> 01:31:51,590

putting them down I'm just being factual

1973

01:31:56,050 --> 01:31:54,079

Louella is on it for example when he

1974

01:31:58,149 --> 01:31:56,060

went to the SCU this year which is the

1975

01:32:02,020 --> 01:31:58,159

scientific coalition of you APs of a

1976

01:32:04,510 --> 01:32:02,030

study by the way studies he actually did

1977

01:32:09,609 --> 01:32:04,520

a talk on meta materials but he did not

1978

01:32:12,729 --> 01:32:09,619

have any reports or data to back up his

1979

01:32:14,500 --> 01:32:12,739

science to support the the science of

1980

01:32:16,089 --> 01:32:14,510

what he was talking about the scientific

1981

01:32:18,879 --> 01:32:16,099

breakthrough or whatever it was he was

1982

01:32:21,850 --> 01:32:18,889

mentioning and TTS a seems to have a

1983

01:32:23,649 --> 01:32:21,860

pattern of mentioning or teasing the the

1984

01:32:28,839 --> 01:32:23,659

public about things that they might be

1985

01:32:31,390 --> 01:32:28,849

onto or or discovering or you know of is

1986

01:32:34,260 --> 01:32:31,400

something that they're doing research on

1987

01:32:40,000 --> 01:32:34,270

but they have no reports to back it up

1988

01:32:42,100 --> 01:32:40,010

do you have any perspective on that yes

1989

01:32:51,819 --> 01:32:42,110

I think this is something I've noticed

1990

01:32:56,979 --> 01:32:51,829

and worried about the I had hoped that

1991

01:33:03,300 --> 01:32:56,989

TTS a would spend some effort performing

1992

01:33:05,800 --> 01:33:03,310

scientific research and that involves

1993

01:33:10,540 --> 01:33:05,810

collecting data which they appear to be

1994

01:33:13,510 --> 01:33:10,550

doing and basically then reporting their

1995

01:33:14,740 --> 01:33:13,520

findings and and discussing openly with

1996

01:33:17,410 --> 01:33:14,750

other scientists which

1997

01:33:22,540 --> 01:33:17,420

they're not doing or at least not that

1998

01:33:26,050 --> 01:33:22,550

I've I know about so that was you know

1999

01:33:30,610 --> 01:33:26,060

quite the case when we were at the seu

2000

01:33:34,570 --> 01:33:30,620

meeting we had you know discussions with

2001

01:33:37,000 --> 01:33:34,580

many questions where there were answers

2002

01:33:41,520 --> 01:33:37,010

unable to be given whether this is going

2003

01:33:45,730 --> 01:33:41,530

to violate you know somebody's

2004

01:33:48,430 --> 01:33:45,740

disclosure agreement or whether it's

2005

01:33:55,870 --> 01:33:48,440

going to disclose too much that's going

2006

01:33:57,820 --> 01:33:55,880

to jeopardize the television show this

2007

01:33:59,140 --> 01:33:57,830

is frustrating because we don't care

2008

01:34:00,820 --> 01:33:59,150

about TV shows we care about

2009

01:34:04,050 --> 01:34:00,830

non-disclosure agreements I understand

2010

01:34:06,730 --> 01:34:04,060

that but but then in that case you

2011

01:34:08,770 --> 01:34:06,740

you're you know what you're the claims

2012

01:34:10,720 --> 01:34:08,780

are making are unsupported and that

2013

01:34:12,340 --> 01:34:10,730

they're going to be treated with a grain

2014

01:34:13,870 --> 01:34:12,350

of salt by the scientific community

2015

01:34:16,210 --> 01:34:13,880

because you don't you're not presenting

2016

01:34:19,000 --> 01:34:16,220

evidence and you know we need to see

2017

01:34:22,090 --> 01:34:19,010

evidence we need to see see evidence we

2018

01:34:24,580 --> 01:34:22,100

need to see that the train of logic that

2019

01:34:26,080 --> 01:34:24,590

led you you through the analysis and

2020

01:34:27,430 --> 01:34:26,090

allowed you to make the inferences that

2021

01:34:29,860 --> 01:34:27,440

you made from that data that's very

2022

01:34:31,630 --> 01:34:29,870

important and I think that sharing

2023

01:34:33,370 --> 01:34:31,640

information with other scientists is

2024

01:34:36,460 --> 01:34:33,380

paramount in the scientific community

2025

01:34:42,040 --> 01:34:36,470

and this is something that I haven't

2026

01:34:43,330 --> 01:34:42,050

seen tts a really getting involved in

2027

01:34:46,330 --> 01:34:43,340

which I had hoped that they would do

2028

01:34:48,640 --> 01:34:46,340

whether this is from their wanting to

2029

01:34:51,220 --> 01:34:48,650

keep things close to their chest you

2030

01:34:54,520 --> 01:34:51,230

know for you know their own gain or

2031

01:34:58,180 --> 01:34:54,530

whether you know it's the whole

2032

01:35:00,100 --> 01:34:58,190

non-disclosure issues resulting from

2033

01:35:01,570 --> 01:35:00,110

people's previous employments I don't

2034

01:35:04,000 --> 01:35:01,580

know what that is or maybe it's just an

2035

01:35:05,620 --> 01:35:04,010

atmosphere of them used to working in a

2036

01:35:07,330 --> 01:35:05,630

situation where they don't share data I

2037

01:35:10,030 --> 01:35:07,340

don't know I don't know precisely what

2038

01:35:12,070 --> 01:35:10,040

the situation but I would really hope

2039

01:35:15,250 --> 01:35:12,080

and I would be very enthused if they

2040

01:35:18,160 --> 01:35:15,260

would share more data and be more be

2041

01:35:20,260 --> 01:35:18,170

more open when you get your hands on

2042

01:35:22,060 --> 01:35:20,270

these possibly tea fragments that you

2043

01:35:23,650 --> 01:35:22,070

discussed earlier you'll you'll share

2044

01:35:24,790 --> 01:35:23,660

with us you'll tell us first right oh

2045

01:35:27,880 --> 01:35:24,800

yeah

2046

01:35:29,620 --> 01:35:27,890

I haven't signed any non-disclosure

2047

01:35:30,850 --> 01:35:29,630

agreements with anybody I'm gonna I'm

2048

01:35:32,290 --> 01:35:30,860

gonna write up my work and I will

2049

01:35:35,230 --> 01:35:32,300

publish it and I will give you all the

2050

01:35:36,400 --> 01:35:35,240

gory details of the analysis I did you

2051
01:35:44,710 --> 01:35:36,410
know to the point where you can't stand

2052
01:35:46,360 --> 01:35:44,720
it anymore so I asked PTSA not that they

2053
01:35:50,680 --> 01:35:46,370
listened I'm not saying that but if I

2054
01:35:53,140 --> 01:35:50,690
publicly asked T TSA to please share any

2055
01:35:55,900 --> 01:35:53,150
reports or anything to back up the

2056
01:35:59,590 --> 01:35:55,910
claims that they're making and I was met

2057
01:36:02,860 --> 01:35:59,600
with such hatred from certain fan groups

2058
01:36:06,820 --> 01:36:02,870
of T TSA that are totally like I guess

2059
01:36:10,360 --> 01:36:06,830
you come fanboys they're totally devoted

2060
01:36:15,700 --> 01:36:10,370
to T TSA which is fine but the reaction

2061
01:36:20,350 --> 01:36:15,710
I got was they were outraged that I

2062
01:36:23,080 --> 01:36:20,360
would ask for that and I was told by a

2063
01:36:25,240 --> 01:36:23,090

certain person in the UFO community I

2064

01:36:28,690 --> 01:36:25,250

won't mention names that I should feel

2065

01:36:32,430 --> 01:36:28,700

lucky that T TSA has gotten us as far as

2066

01:36:35,950 --> 01:36:32,440

they have regarding the topic of ufology

2067

01:36:38,230 --> 01:36:35,960

because they've progressed and put us in

2068

01:36:40,780 --> 01:36:38,240

a direction much farther head than

2069

01:36:43,750 --> 01:36:40,790

anybody else ever has in the 56 year

2070

01:36:46,240 --> 01:36:43,760

whatever many years you apology has been

2071

01:36:48,210 --> 01:36:46,250

around and leave it at that

2072

01:36:50,620 --> 01:36:48,220

but see that's not that's not

2073

01:36:53,050 --> 01:36:50,630

satisfactory enough for me well it's not

2074

01:36:54,790 --> 01:36:53,060

you know it's fine they can do whatever

2075

01:36:56,410 --> 01:36:54,800

they want you know that's that's the

2076

01:36:57,850 --> 01:36:56,420

truth but they can't call it scientific

2077

01:37:00,640 --> 01:36:57,860

research if they're not going to engage

2078

01:37:02,440 --> 01:37:00,650

the scientific community scientifically

2079

01:37:06,010 --> 01:37:02,450

and that means sharing data sharing

2080

01:37:07,210 --> 01:37:06,020

information and and that and so if

2081

01:37:09,040 --> 01:37:07,220

they're not going to do that then it's

2082

01:37:11,830 --> 01:37:09,050

not scientific research and then those

2083

01:37:13,990 --> 01:37:11,840

you know those claims are just wrong and

2084

01:37:16,060 --> 01:37:14,000

I don't think any of us should feel

2085

01:37:18,640 --> 01:37:16,070

lucky at this point I'm going to reread

2086

01:37:20,920 --> 01:37:18,650

my response to this statement like that

2087

01:37:23,530 --> 01:37:20,930

is I'm going to reread one of the

2088

01:37:25,720 --> 01:37:23,540

sentences from my conclusion and it is

2089

01:37:27,760 --> 01:37:25,730

ironically such attitudes inhibit

2090

01:37:29,440 --> 01:37:27,770

scientific study perpetuate a state of

2091

01:37:32,080 --> 01:37:29,450

ignorance about these phenomena that has

2092

01:37:34,240 --> 01:37:32,090

persisted for well over 70 years and is

2093

01:37:35,339 --> 01:37:34,250

now detrimental since answers are

2094

01:37:37,080 --> 01:37:35,349

presently needed

2095

01:37:39,780 --> 01:37:37,090

there's no reason that we should be

2096

01:37:43,350 --> 01:37:39,790

desired this this ignorant about this

2097

01:37:47,010 --> 01:37:43,360

phenomenon and and this is not safe and

2098

01:37:51,720 --> 01:37:47,020

so I think we need to move past this ok

2099

01:37:52,500 --> 01:37:51,730

so just one last question and then I'll

2100

01:37:55,530 --> 01:37:52,510

leave it alone

2101

01:37:57,450 --> 01:37:55,540

what do we do if TTS a never brings out

2102

01:38:06,629 --> 01:37:57,460

anything to back up the claims that

2103

01:38:08,330 --> 01:38:06,639

they've made what's that because we are

2104

01:38:10,950 --> 01:38:08,340

working to do things properly

2105

01:38:13,200 --> 01:38:10,960

scientifically out in the open where we

2106

01:38:15,359 --> 01:38:13,210

can all learn from this ok thank you

2107

01:38:18,930 --> 01:38:15,369

yeah you had mentioned getting hold

2108

01:38:21,750 --> 01:38:18,940

possibly of that possible eg fragments

2109

01:38:24,030 --> 01:38:21,760

are possible what do you think your

2110

01:38:26,399 --> 01:38:24,040

turnaround time would be before you were

2111

01:38:40,020 --> 01:38:26,409

able to say I should figure out where

2112

01:38:44,010 --> 01:38:40,030

this is problem it depends on all the

2113

01:38:48,629 --> 01:38:44,020

other projects early I do too many

2114

01:38:50,970 --> 01:38:48,639

things so so that's hard to say well I

2115

01:38:51,990 --> 01:38:50,980

thank you so much for your time that's

2116

01:38:54,359 --> 01:38:52,000

tonight

2117

01:38:56,490 --> 01:38:54,369

you know you've actually taken a lot of

2118

01:38:58,979 --> 01:38:56,500

discretionary time to spend with us at

2119

01:39:01,410 --> 01:38:58,989

such a late point in the evening also

2120

01:39:02,280 --> 01:39:01,420

Kevin and Frank did you have any more

2121

01:39:10,020 --> 01:39:02,290

questions

2122

01:39:11,819 --> 01:39:10,030

we are good ok yeah a lovely evening

2123

01:39:15,810 --> 01:39:11,829

it's been very enlightening extremely

2124

01:39:17,819 --> 01:39:15,820

educational and also you know I just

2125

01:39:20,550 --> 01:39:17,829

thank you for allowing us to just ask

2126
01:39:25,680 --> 01:39:20,560
you any question he's been just so kind

2127
01:39:27,209 --> 01:39:25,690
in allowing us just the luxury of being

2128
01:39:29,490 --> 01:39:27,219
able to spend this kind of time with you

2129
01:39:30,990 --> 01:39:29,500
so thank you so much thank you so much

2130
01:39:32,370 --> 01:39:31,000
for having me I really appreciate it

2131
01:39:34,700 --> 01:39:32,380
myself as well

2132
01:39:36,959 --> 01:39:34,710
and before we go I did want to ask you

2133
01:39:39,450 --> 01:39:36,969
where are you gonna go this year getting

2134
01:39:41,250 --> 01:39:39,460
you any talks I'd like to at least let

2135
01:39:42,930 --> 01:39:41,260
our listeners know if you're going to

2136
01:39:45,180 --> 01:39:42,940
travel anywhere to do any talks on

2137
01:39:46,830 --> 01:39:45,190
anything and if you are where are you

2138
01:39:48,959 --> 01:39:46,840

gonna go and what are those talks gonna

2139

01:39:51,450 --> 01:39:48,969

be about

2140

01:39:54,030 --> 01:39:51,460

let's see I will be going to the next

2141

01:39:57,720 --> 01:39:54,040

meeting that SCU holds I think that's

2142

01:40:01,140 --> 01:39:57,730

going to be in mid June of 2020 I'm

2143

01:40:04,050 --> 01:40:01,150

going to be at the there's a quantum

2144

01:40:08,520 --> 01:40:04,060

foundations meeting in BEC WA Sweden

2145

01:40:09,660 --> 01:40:08,530

which is in typically early June or

2146

01:40:11,130 --> 01:40:09,670

actually I think it'll be right after

2147

01:40:13,110 --> 01:40:11,140

the SCO meeting so I'll probably

2148

01:40:16,110 --> 01:40:13,120

actually go from Alabama to Sweden so

2149

01:40:18,060 --> 01:40:16,120

I'll be talking there and and I'm also

2150

01:40:20,189 --> 01:40:18,070

planning going to the MaxEnt meeting I

2151

01:40:24,240 --> 01:40:20,199

go to those almost every year though

2152

01:40:28,140 --> 01:40:24,250

that one will be in Austria in July of

2153

01:40:32,370 --> 01:40:28,150

next year thank you so much for your

2154

01:40:35,370 --> 01:40:32,380

time tonight Kevin thank you so much I

2155

01:40:37,110 --> 01:40:35,380

really enjoyed myself alright and we are

2156

01:40:39,990 --> 01:40:37,120

out of here it is late in the East so

2157

01:40:42,540 --> 01:40:40,000

it's past my bedtime got to go we'll be

2158

01:40:44,700 --> 01:40:42,550

back a Tuesday night with Derek Gilbert